Keep Your Card in This Pocket

MOTION PICTURES IN EDUCATION

A PRACTICAL HANDBOOK FOR USERS OF VISUAL AIDS

BY

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WITH AN INTRODUCTION BY

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INTRODUCTION

SCHOOLS are old, but the effort to adapt them to the interests and needs of all children and of adult men and women as well and to make them take hold on the life and work of the world in which we now live is new. The more sincere this effort becomes and the wider and clearer the vision of the purposes and possibilities of education, the keener becomes the search for more effective methods of teaching and the more willing are we to pay the cost of satisfactory results, whatever the cost may be. It is for this reason that we are now paying twenty times as much for education in the United States as we paid fifty years ago, more than six times as much in proportion to population, and are paying far more willingly than we formerly paid the smaller amount.

The increase in expenditures for education is not more remarkable, however, than the enrichment of courses of study, changes in methods, and extension of equipment for teaching. In these fifty years the work and play of the kindergarten, nature study, the physical sciences, literature, sociological subjects, agriculture, home economics, trades and industries, commercial subjects, music, physical training, hygiene and sanitation, have become essential parts of the curriculum. Laboratories, shops, playgrounds, libraries, maps and charts in abundance and large variety, museum collections, plats of ground, plants and animals, pictures, both in

prints and slides, and films for projection have been added to the meagre equipment of textbook, desk and blackboard, and the rod and other instruments of punishment far more numerous then than now. The chief value of all this added equipment is to provide an abundance of helpful concrete material and opportunity for self-activity in analyzing, organizing, and interpreting it.

Among these additions to equipment for the increase of interest and the assurance of success in teaching, the most recent and probably the most valuable is the motion picture. Certainly the use of no other means of teaching has ever increased so rapidly, nor has any other ever gained at the same time such popularity with all classes of people, in school and out. Though the first motion picture machine using films was exhibited at the World's Fair at Chicago just thirty years ago, the production, distribution and exhibition of motion pictures has for several years been one of our largest industries. The commercial use of motion pictures for entertainment still overshadows their educational use, but their value in schools of all grades, especially in high schools, colleges, professional and technical schools, and in extension classes, farmers' institutes, women's clubs, and commercial, civic and social organizations of all kinds, is gaining recognition rapidly. Many hundreds of high schools and college lecture rooms are now equipped with films and projecting machines. When the results in more effective teaching and in time saving are considered, the pictures are not costly. If they were in general use in all schools, the cost would be only a very small percent of the total cost of education. When their value is fully understood and the means of supplying pictures adapted to school use have been bet-

ter worked out, they will, no doubt, be considered as necessary a part of school equipment as are textbooks, maps, charts and blackboards. The perfection of the means of producing color films, stereoscopic films, and talking films will hasten this.

Toward this more effective and more general use of motion pictures in education this book should prove a valuable aid. Its publication at this time is opportune in a high degree. The wide experience of the authors and their knowledge of the principles of education and of school room practice have enabled them to make a book sound in principle, practical in application, and readable. For these qualities I commend it to all who are interested in this subject. It is fortunate that the pioneer book in this field is of so high a standard.

The authors are experienced in both teaching teachers and in selecting and preparing films for educational use. Mr. Ellis' experience as instructor in preparatory school, as Chief of the Education Section of the United States Forest Service and as organizer and director of the motion picture section of the United States Department of Agriculture and Miss Thornborough's experience as film editor for the U. S. Government and as a newspaper writer and editor have also added to their equipment for this work.

All the twelve chapters are interesting and valuable, and it is good to have brought together in one book a discussion of the history and principles of visual education, the story of the origin and growth of motion pictures and their use in education, a critical discussion of their value and of different methods of using them, directions for installing apparatus, the kinds of films now available and where and how they can be had; but it is quite possible that most readers of the book

will find chapters six, seven, eight and nine—on the time, place and methods of using motion picture films—the most interesting and helpful. I would like to call special attention to the thirteen principles listed and practically applied in chapter nine.

P. P. CLAXTON.

UNIVERSITY OF ALABAMA,
March 10, 1923.

FOREWORD

THIS handbook has been written in response to an obvious and pressing need. Teachers intent upon keeping abreast of advanced pedagogical practice are seeking concrete, definite information as to the use, for instructional purposes, of the newest and least tried of visual aids, the cinema. A book seems in demand which offers a solution to the very practical problem being constantly presented:—What educational films are available, and where and how they should be used in teaching.

A demand no less evident is manifested by producers of educational films, who need to be kept apprised of the requirements of the school world, in order that correct pedagogy be reflected in their productions. One of the factors which has delayed the growth of the educational film has been the scarcity of producers qualified both in teaching and in motion picture technique.

A carefully prepared handbook, written by investigators, possessed of the twofold point of view of the film technician and the teacher, can not help but aid in bringing together the two divergent points of view and in assisting both elements to attain their common purpose. Such a book should fully discuss the problem and its difficulties, the shortcomings and limitations as well as the advantages of the proposed methods, what others have found out concerning it, and then make direct recommendations, based upon accepted principles of pedagogy, correct reasoning, sound investigation, observation and experiment, as to the methods consid-

ered best. In presenting this work to the educators of the country, it is our hope that we may be found, in some small measure, to fulfill the requirements which we have had the temerity to set down.

Schools in many parts of the land are using films for purposes of instruction. Such films are growing in number and improving in quality. Their effectiveness as teaching material is being investigated under competent supervision. Producers and users are according sincere coöperation to one another in their respective fields. And standards of production and utilization are being evolved.

This book is dedicated to the motion picture alone, not in any sense to the disparagement of the slide, the stereograph, or other form of visual aid, but only because the film is newest and least used, the methods for its use least developed, the need of definite suggestions concerning its use greatest, and the subject large and important enough in itself to justify a separate treatment.

The motion picture has been accepted by educators as an important factor in instruction. It remains now to perfect the methods of their application to school needs. We hope that this handbook will succeed in contributing something toward this end, that it will prove helpful to teachers in their efforts to use this new medium correctly, and that it will add something of definite even though modest value to the growth and standardization of the cinema as a visual aid.

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I

THE HISTORY OF EDUCATION WITH REGARD TO VISUAL AIDS

EDUCATION is the imparting and acquisition of knowledge. One way in which we gain knowledge and become educated is by experience. We gain experience through the senses.

"Seeing is believing" is an ancient adage in which there is more than a modicum of truth. That a large portion of the sum total of knowledge gleaned by the human race has come through the sense of sight is indisputable.

The eye is the most retentive as well as the most observant of human sense organs. With many of the lower animals other senses are predominant, the sense of smell in some, hearing with others, but in man, sight is ascendant among his faculties. While oral methods may have been the first used by man in the transference of ideas, although there is authority for asserting that even here the visual was first, it is certain that visual images were used in the dim ages of antiquity to convey information and even to teach. The sand was used as a blackboard in the open-air village schools of ancient India. And mankind today is learning from drawings and paintings discovered in ancient caves in France and Spain the types of animals familiar to men of paleolithic times, who lived

five or ten thousand years before the dawn of recorded history.

The earliest records are picture records. The purpose of these records was to inform, to educate. It is now generally believed that the cavemen drew pictures on their walls not as a means of ornamentation but primarily to impart facts, as to issue warnings. Certainly their purpose was to convey ideas.

Egyptian hieroglyphics mark the transition between picture writing and the early alphabets of the ancients. Pictures are and always have been primarily a means of conveying information and are in form, antecedent and purpose essentially educational.

In studying the history of education we see that educational theory in modern times has followed three distinct lines. The humanists relied for purpose of school training on the study of good authors with their records of human experience. The realists believed that teaching the child from books was secondary in importance to bringing him into direct contact with nature and reality. The naturalists maintained that the child can be prepared for life only by living.

Foremost among the realists was John Amos Comenius (1592-1671), who gave the world the *first illustrated textbook,* in his *Orbis Pictus* or *The World Illustrated.*

Comenius believed that the child could not learn through words alone. He, therefore, appealed to the eye and the mind of the pupil through the skill of the artist. Words were clarified and impressed by pictures or by the thing itself when possible. His *World Illustrated* became the most popular schoolbook in Europe and held that place of distinction for nearly a century.

Pestalozzi (1746-1827) and Rousseau (1712-1778), representing the naturalist school, taught that the child should learn life by living and preached a "return to nature." Froebel (1782-1852), who put Pestalozzi's theories into practice, believed in developing the senses of sight and touch and employed visual aids in his famous kindergarten.

One of the greatest impulses given visual education has been afforded by the British Museum. Art galleries and museums are, in a sense, merely visual aids. The sculpture of ancient Greece and the paintings of medieval Italy were visual aids to education, religious and civil. People have made collections of paintings, statues, minerals and metals, of birds and butterflies, because of their special interest in these objects, because they wanted to see, to study, to observe these things at their leisure and enable others to do so. The British Museum, which was opened to the public in 1759 and contains printed books, manuscripts, prints and drawings, antiquities of many nations and people, coins and medals, and biological and geological exhibits, is the largest and the oldest existing of these storehouses of knowledge and has long been a most prominent and potent factor in the promotion of visual education.

To Comenius, however, belongs the distinction of introducing visual education to the modern world. He may properly be called the father of visual education. And may we not name as the grandfather the teacher who first drew pictures in the sands of India and as the great grandfather that paleolithic man who first began to build a picture language on stone before the dawn of recorded history?

It is apparent that visual aids are fully as old as

education itself. The picture has grown steadily as an aid in teaching, from the time when earliest man carved his first crude drawings in stone until the art of photography and cheap reproduction made pictures accessible to all.

The Photographic Art

An even hundred years ago, the photographic art began. In 1822 the first permanent photographs were secured by a Frenchman named Niepce. As early as 1802 a process by which records could be made by the action of light was discovered by a certain Tom Wedgewood, but no method of fixing it was then known. Photography, considered a recent art, is a centenarian and visual education is much older.

Out of the photograph quickly grew the stereoscope and the lantern slide, and all three have found a prominent and lasting place in the world's educational systems. Blackboard drawings, illustrations in textbooks, graphs, maps, charts, photographs, stereoscopes and the stereopticon have long since become intimately interwoven in the fabric of pedagogy. The Visual Instruction Division of the New York State Department of Education announced that in 1922 it was circulating something over a half million slides besides numerous photographic prints.

A New Art

And now has come a new form of illustration, ushered in with the twentieth century, an art made up of all the methods of picturization which have gone before, an art which adapts itself naturally and basically to instructional use. This new form of picturization is the *motion picture.* It combines the principles of the

photograph and the lantern slide with the earlier arts of drawing and has added to them the semblance of motion. As a result we have a composite which seems destined largely to revolutionize illustrative pedagogy.

It must be borne in mind that while education has been developing for several centuries, the motion picture has only been available for education for the past few years. It is logical to assume that Comenius and Froebel would have eagerly seized upon the motion picture as an aid to education if it had been available to them. The cinema has disclosed a whole new world for observation and study. It has brought the miracles and wonders of nature to the pupil, has shown him the microscopic life of the ocean, life in the arctic and antarctic regions, how a plant unfolds, how a caterpillar becomes a butterfly and many of the long hidden mysteries and secrets of Mother Earth.

The motion picture has recently passed through stages that the other arts completed ages ago. A brief history may be of some value to those interested in visual instruction. What are motion pictures? Who invented them? When? Where? How?

What do we mean by "motion pictures"? The definition of Dr. Rowland Rogers, instructor in Motion Picture Production at Columbia University, is, "Motion pictures are a method of communicating thought by means of a series of photographs projected in rapid succession to simulate action."

F. A. Talbot, in his book, *Practical Cinematography,* says:

> Animated photography is an optical illusion purely and simply. The eye imagines that it sees movement. Each picture is an isolated snap-shot taken in the fraction of a second. In projection the images follow so rapidly that the

successive views dissolve into one another. The explanation is persistence of vision. This peculiarity of the eye and brain remains a scientific puzzle.

Animated photography grew out of still photography, and its development was gradual. Valuable contributions were made by a number of the early experimenters and investigators.

While the development of the motion picture is new, the idea behind it is old. As long ago as 65 B.C., Lucretius in his *Rerum Natura* wrote of "images that appear to move," and Ptolemy, the Greek philosopher, wrote a series of books on optics about 130 A.D., in which he spoke of persistence of vision and described simple apparatus by means of which the phenomenon might be observed. It is the existence of this phenomenon that has made possible the development of the "moving picture."

Some see the dawn of the idea of motion pictures in the nursery toy, "The Wheel of Life," invented in 1833 by W. H. Horner, which proved quite popular in England and also in America, where it made its appearance ten years later. This consisted of a hollow cylinder with vertical slits cut into it and having representations on the inner surface. By turning the wheels the drawings or paintings of animals or people in different positions, seen in rapid succession, gave the idea of continuity of motion.

It must be remembered that the development of the motion picture we know today has been made possible by a number of contributing factors, the most important being the development of the art of photography, the discovery of a flexible sensitized medium for recording photographs, and the invention of apparatus for taking and showing pictures.

Dr. Sellers, of Philadelphia, amusing himself with this nursery toy, made a series of photographs of his two sons, picturing one in the act of driving a nail and the other seated in a rocking chair, rocking. To show them to better advantage than was possible in The Wheel of Life, he invented a machine, the Kinematoscope, patented in 1861. He was the first to use *photographs* of real people in continued action and to arrive at the conclusion that to obtain continuity of motion the picture should be at rest during the moment of vision. This is the principle of the intermittent movement, used today in both motion picture cameras and projectors. In 1860 Dr. Sellers made what was probably the first camera for taking pictures to be reproduced to simulate motion.

A photographic study of a horse race made by the Englishman Edward Muybridge, in 1872, at Palo Alto, California, furnished the next step forward. Muybridge's objective was the analysis of movement. He secured twenty-four cameras, placed them at the edge of the race-course, conveniently close together, with a fine thread attached to the shutter of each and stretched across the track so that a horse in passing would break the string and make an exposure on the sensitized plate.

The results created such surprise and enthusiasm that Muybridge then took up in earnest his experiments in pictured motion, which continued twenty years. He invented a machine, the Zoopraxoscope, which projected "moving" pictures *on a screen, thus enabling a number of persons* to watch the results simultaneously. Muybridge's machine consisted of a large glass disc with reproductions of the photographs taken with different cameras set along its margin. It

was also Muybridge who, working at the University of Pennsylvania, succeeded in making the first instantaneous photographs, an essential step in cinematography.

Muybridge gave twenty-five years of his life to the cause of pictured motion. He succeeded in taking instantaneous photographs of rapid action and in projecting them on a screen in such a way that the spectator received the impression of continuity of motion.

The first published report of Muybridge's experiments was received with great interest by artists and scientists in Europe and America. In 1881 Muybridge made his first appearance in Europe, addressing a group of eminent scientists at Paris at the laboratory of Dr. E. J. Marey, who was soon to make valuable contributions to the growth of the cinema.

In 1882 Dr. Marey announced the invention of a "photographic gun," the first camera capable of taking, through a single lens, the number of exposures per second requisite for recreating the illusion of motion when projected. In his book entitled *Movement,* Dr. Marey describes his invention as follows:

> We united in a single apparatus all the accessories necessary for chronophotography on fixed or moving plates as well as for regulating at will the frequency and duration of the exposures. The weak point of the photographic gun was principally that the images were taken on glass plates. The maximum was twelve pictures in the second and had to be very small. These difficulties may be overcome by substituting for the glass disc a continuous film very slightly coated with gelatine and bromide of silver.

This book, published in 1895, also contains detailed accounts of some extremely interesting early scientific experiments in pictured motion to which reference will be made later.

While Dr. Marey was making a scientific study of movement, one Thomas A. Edison of East Orange, N. J., had become interested in Muybridge's experiments, and his inventive mind began to work on the development of pictured motion. To him we owe the Kinetograph, a recording machine for taking motion pictures as now used.

Motion pictures may be said to have been formally presented to the American public at the Chicago World's Fair in 1893. Here Muybridge exhibited on his revolving disc machine 20,000 original photographs dealing chiefly with animal movement, which were viewed by men of science from all over the world, and here Edison exhibited his Kinetograph, *the first motion picture machine employing film,* which immediately sprang into popular favor. In the Kinetograph the observer looked at the film instead of at the screen, and only one person could see the picture at a time. The basic invention of motion pictures as we know them today was here, but more work was needed to be done on them.

Mr. Edison, in a letter to the authors, refers to his invention as follows:

> I was the first man to invent the motion picture apparatus. The Kinetograph was the name that I gave to the recording or "Taking" machine. If you will examine the projecting machine to enlarge pictures and show them on the screen you will find that it is nothing but the recording machine reversed, but it was necessary to add certain details and devices to make this reversal practical.

The means of throwing pictures on a screen by means of a moving film was yet to be developed.

Although the art of photography had advanced until the taking of instantaneous photographs was now pos-

sible and cameras had been invented by means of which photographs could be taken in rapid succession through a single lens, other problems remained for the early inventors to overcome, namely to find a proper vehicle to carry the pictures and mechanism for showing them. Many were the scientists who labored to discover an adequate medium to receive the photographic exposures. Edison realized from the first that a light, flexible medium was needed to replace the bulky glass plates. About 1888, George Eastman, a manufacturer of dry plates, in Rochester, N. Y., began experiments to find something to replace glass plates, which were both bulky and breakable. He first tried a transparent paper covered with an emulsion. But it was not until the Rev. Hannibal Goodwin at last hit upon celluloid as a base that a satisfactory substitute was obtained. Its possibilities were immediately recognized by Eastman, who is largely responsible for its development.

In 1889 a flexible film became available to inventors at work on the problem of recording and reproducing pictured motion. At first negative film stock was used as positive also, and it was not until 1895 that the Eastman company began commercially to manufacture positive film, the demand for which has grown to millions of feet a month. It is interesting to note that for some time after the inception of motion pictures a much wider film stock than that employed at present was used.

Now that a medium for receiving pictured impressions was at hand it remained for inventors to find a means for showing the pictures. C. Francis Jenkins, a young clerk in the U. S. Treasury Department at Washington, came forward with a machine which

would project on a wall or screen pictures from moving celluloid film so that these "moving pictures" (the expression was not invented until much later) could be seen by a number of persons at once.

Mr. Jenkins' story of his early invention as told the writer is interesting:

> I began working on the development of an apparatus for recording and reproducing motion in 1890 and the film I used in my first camera and projector and subsequently was kodak film, purchased in the local photo supply shops, slit and joined into long, narrow ribbons by cementing with collodion. My first exhibitions were in 1892, private affairs. My first public exhibition was in Washington in 1893, but the first public performance of which there is any newspaper or other written account was held on June 6, 1894, at Richmond, Indiana.

Here on the walls of a jewelry store a showing of pictures made on celluloid film and projected on a simple apparatus was given before a small group of interested relatives and friends—a performance that was afterwards to become famous in motion picture history. The necessary light was supplied by an electric arc and the electric current to feed it was obtained from the trolley wire outside. Not only was it the first public showing of motion pictures of which we have record but it was the first showing of colored films. The subject of the film was a butterfly dance by a popular vaudeville star, and each separate picture had been painstakingly colored by hand.

In March, 1895, Jenkins and Thomas Armat entered into partnership for making projection machines which would throw pictures on a wall where they could be seen by a group of people. At the Cotton States Exposition in Atlanta, 1895, Jenkins and Armat gave public showings at an admission price

of twenty-five cents, using two projection machines, the amusement-loving public's first opportunity to become movie fans! A fire broke out, destroyed the equipment and left the two inventors stranded. Soon afterwards they parted company. In 1896 Armat and Edison entered into an agreement for the making of an improved Jenkins-Armat machine under the name of Edison Vitascope—Armat Design. Jenkins received for his interests the sum of twenty-five hundred dollars.

On April 27, 1896, New York saw its first motion picture show, pictures being projected on a screen at a theatre on 23rd Street, and in June of the same year the Cinematograph projector, perfected by Lumière of Paris, using Edison's "peep-hole" machine as a model, was brought to New York, and a motion picture show was given with it at Keith's Union Square theatre.

From that time on showmen saw the entertainment possibilities of this new medium and developed them.

First Motion Pictures Educational

It is most significant however, that Muybridge's experiments, which mark the real beginning of motion pictures, were scientific in character and results. The first use of motion pictures, by the founder of the art, was in education. Moreover, for many years Muybridge's experiments were conducted at the University of Pennsylvania with funds appropriated by the University as a contribution to the advancement of science and education. In taking up the work practically where Muybridge left off, Dr. Marey also devoted his experiments solely to the attainment and demonstration of scientific facts. Dr. Marey was an eminent

French scientist, a member of the Institute and of the Academy of Medicine, Professor at the College of France and Director of the Physiological Station, where most of his experiments in pictured motion were conducted.

In the preface of his authoritative work on *Movement,* previously referred to, Dr. Marey says:

> The Graphic method, with its various developments, has been of immense service to almost every branch of science. * * * Almost all vital functions are accompanied by movement, but any attempt to investigate them is beset with difficulty, for the majority are very complicated or very rapid, but it occurred to us that many of these problems could be solved by chronophotography. [This is the name given by Dr. Marey to what we now call cinematography]

Some of Dr. Marey's early motion pictures are of as much scientific interest today as when they were performed. One extremely interesting one was made to discover the way the flight of one insect differs from that of another. Others showed to eager scientists the locomotion of animals in water—the jellyfish, comatula, eel, skate, seahorse, cuttlefish and starfish. In another experiment Dr. Marey succeeded in photographing the successive phases of heart action in the tortoise under conditions of artificial circulation and was thus enabled to study the mechanism of cardiac pulsation. It was now possible to *see* the beating of a heart! This was the first application of motion pictures to experimental physiology. In recording this experiment Dr. Marey writes enthusiastically:

> By means of chronophotography we were enabled to make direct examinations of the movements of the heart by a more subtle eye than our own and one that is capable of grasping in a moment the sum total of changes which take place in the cavities of the heart.

It was Dr. Marey and his associates who first took pictures of moving objects under the microscope. One of the earliest experiments showed the movements of the blood in capillary vessels.

Another pioneer scientific investigator who stands out prominently is M. J. Carvallo of France, who, as sub-director and secretary of the Marey Institute, was probably the first to harness the X-ray to cinematography. He succeeded as early as 1900 in producing pictures in motion showing the process of digestion in the stomach of a frog.

Dr. J. Comandon, also of the Marey Institute, was probably the first to popularize the educational film. He made successful X-ray cinematographs of the bending of the knee, the opening of the hand, the play of the muscles and also marvelous micro-cinematographs of micro-organisms so minute that two million of them occupy a cube measuring 1/25 of an inch across.

It was about this time that the well-known firm of Pathé Frères first made its appearance. Under its auspices Comandon did much of his work. So minute was much of his subject material that he had to employ the ultra-microscope in making some of his films, a wonderful accomplishment in that early day of the cinema. Some of his magnifications were as large as 50,000 times natural size, a minute organism, much too small to be seen with the naked eye, appearing on the screen as large as a dinner plate. These earliest of microscopic films were shown at the Sorbonne, where they were pronounced a new and reliable means of teaching bacteriology and of solving many problems theretofore impossible of solution.

A film of peculiar interest made in Europe early in

(*Community Motion Picture Service*)

(*Pathe*)

(*Pictorial Club*)

the century was a picture record of the union of the sperm and the ovum. Another showed the separation of the membrane and segmentation of the sea-urchin. These were made by Dr. G. Ries of Switzerland. In another film, made by M. Demeny of France, the way in which the tongue moves in the articulation of consonants was shown. It was believed that films of such nature would prove most useful in teaching the dumb to speak.

Many of these early scientists employed the cinema in research work and original investigations, with most satisfying results, but few of the films they recorded were ever given to the general public because they appealed to only a limited few.

All of these early experiments and accomplishments in Europe were in the cause of education and instruction. The use of motion pictures for entertainment was a later development. It remained for the showmen of America to discover the entertainment value of the film and to develop it into an important industry. It is obvious that the field of education has first call on the cinematographic art.

Since the early days of its development theatrical use has prompted a growth, refinement and perfection of the art such as education and science could not possibly have contributed in so short a time. In a little more than a quarter of a century, the art under the stimulus of demand for recreation has progressed from crude beginnings to the fifth industry of our nation, the most popular form of entertainment in the world, an art, if you wish to call it such, which helps mould for good or evil the views and character of the six million people who are said to attend motion picture exhibitions in this country every day. While we

owe the greater part of this development to the recreational field, educational use of films has never been entirely abandoned, has been slowly but steadily increasing and is inevitably destined to become, in the fullness of time, the most extensive as well as the most important use to which the cinema shall have been devoted.

Educators and men of science have instinctively turned to motion pictures for aid in teaching and demonstration. Continually, though spasmodically, has the educational use of the cinema been slowly evolving. Some educators have made excessive claims for the motion picture as the coming panacea of all education's shortcomings, destined to supersede text-books and supplant teachers, to furnish a soft and easy road to knowledge. Others have been equally excessive and intemperate in discounting pictures as a frill, a fad, as of no real merit in education. But between these two extremes have been men and women who have recognized in the motion picture a valuable supplement and aid to the imparting of knowledge and who have been patiently and with much labor and confidence in the future helping the pictures over the rocks of early endeavor.

The production of strictly pedagogical films and the use of films in education have scarcely been started, but sufficient progress has been made in this direction to point the way unmistakably.

II

GROWTH AND DEVELOPMENT OF THE INSTRUCTIONAL MOTION PICTURE IN THE UNITED STATES

WHILE in this country of commerce most attention has been devoted to the development of motion pictures for the more profitable field of entertainment, their value for education, with which Muybridge and Marey first endowed them, was never lost sight of. The Federal Government was among the first to utilize motion pictures on an extended scale for instruction. The U. S. Reclamation Service seems to have been the pioneer among the bureaus at Washington to take up this work, and that bureau exhibited at the Jamestown Exposition 1907 films showing the work of the Government in reclaiming arid lands.

Educational Film Production

The U. S. Department of Agriculture was soon to follow and was the first branch of the Government to establish a laboratory of its own for the production of educational films. Pictures on plant and animal production, forestry, plant and animal diseases, home economics, dairying, food chemistry, road building and numerous other subjects covered by the varied activities of the Department were made. That they have not become more widely known has been owing to the lack of sufficient funds to provide enough copies to meet the popular demand. Their use has been

largely confined to members of the Department and of the State Agricultural Colleges. These films are of considerable educational value, contain a wide range of scientific and practical information and have for a long time probably constituted the largest single collection of educational films on a related group of subjects,—if we except the geographic or travel films, which, because of their wide popular appeal for entertainment and their facility of production, have long formed the largest numerical group.

The manner of growth and development of this pioneer educational film work holds much of interest for those concerned in visual education. The work was not formally established until 1918, when, during the writer's tenure of office, it received recognition and was raised to the dignity of an independent unit. Credit for starting film work in the Department of Agriculture should be given, though seldom is, to Joseph Abel, a photographer in the Bureau of Animal Industry. In 1909 he made a film of the live-stock show at the Alaska-Yukon-Pacific Exposition and, later, films on the Texas Fever Tick and Its Eradication. It all too frequently happens that the real pioneer, the man who struggles against almost insurmountable odds in original creative work and accumulates a vast fund of expert and useful knowledge and experience in the effort is left with his experience and knowledge alone to comfort him, while newcomers who merely use his knowledge and build their reputations on his earlier accomplishments reap the credit for the entire undertaking.

When the Secretary of Agriculture awakened to a realization of the importance of the motion picture in the educational work of the Department, the Section

of Illustrations was authorized to undertake the project, Abel's equipment was transferred and his own work promptly forgotten. Later a governing committee was formed of which the writer was the member representing the Forest Service, a bureau of the Department. Still later, the writer was placed in full charge of the film activities of the Department and organized them into a separate division. In this division were made the first films on forestry in this country, and, we believe, in the world. Among the more important and unique films produced were microcinematographs of plant diseases and analyses of motion studies of the wear of shoe leather by men marching, the latter conducted under the scientific direction of the Bureau of Chemistry for the War Department. The Department of Agriculture, it is believed, was the first successfully to combine cinematography and animated technical drawing, in a film entitled *The Barbarous Barberry*, a study of wheat rust.

Other films of special scientific interest built by the Department were *The Seventeen Year Locust, Poultry Parasites*, and *Grain Dust Explosions*, in which the explosive character of grain dust in suspension was demonstrated. Many films of more popular appeal were produced in that period, such as *Milk and Honey, What a Careless Hunter in the Woods Can Do* and *The Home Demonstration Agent.*

The filming of this wide variety of subjects was facilitated by the fact that in the Department of Agriculture the film efforts of all the seventeen Bureaus were, as they still are, coördinated in one unit, while in other Government Departments where film work is carried on each bureau conducts its own film activities, notably the Bureau of Mines, the Reclamation Service

and National Parks Service of the Department of the Interior; the Bureau of Navigation, Recruiting Division and Marine Corps of the Navy Department; the Signal Corps and Army Medical Museum of the War Department; the Children's Bureau of the Department of Labor and the Bureau of Standards of the Department of Commerce. During the World War, the War and Navy Departments maintained film divisions for the twofold purpose of supplying informational pictures to the public and of instructing officers and men in the science of war.

Films Made During the World War

The Committee on Public Information, created at the time of our entrance into the World War for the dissemination of information concerning the government's war activities, established a film division which, according to the report of George Creel, its chairman, was second only to the newspaper division in spreading information at home and abroad. The film activities of this committee were begun, with the coöperation of the writer, in the motion picture laboratory of the U. S. Department of Agriculture and functioned there until it became a well-established organization and outgrew the Department's facilities. This division by its own large appropriations and through the unlimited coöperation afforded by other branches of the government, the motion picture industry and the general public was able to produce and widely distribute instructional and inspirational pictures which were real factors in maintaining and increasing the morale and patriotism of our people.

Much of the enormous volume of film produced was of permanent historical value, though most was of

ephemeral interest and of value only during a continuation of hostilities. The attention given to motion pictures by the Government during the war gave them an impetus, a dignity and an importance as a medium of conveying information that they never before possessed.

For a time after the close of the war much of this film, particularly that made for the public's information, was available to educational institutions, and some may still be had from various State Universities where they were deposited. Because of necessary governmental post-bellum economies, no provision is now made by the Federal Government for the use of these pictures, and the bulk of this material is now lying largely unused. The stimulus, however, is still felt. The Departments of Agriculture, Interior, Labor and Commerce and, to a smaller extent, other Departments at Washington are carrying on their production of valuable pictures, and several states, educational institutions and private companies are yearly turning out and making available a modest but increasing number of screen studies and pedagogical pictures, and these are visibly improving in quality as time goes on.

Private Production

Many of the large theatrical film companies have from time to time established educational departments, and many firms have arisen which are devoting their time entirely to producing educational films. The latter are in most cases smaller, but more persistent and to a much greater extent engaged in original educational production. The larger companies have devoted themselves more to readapting their theatrical short-

length subjects. Most of the original educational production has been carried on in the smaller independent companies organized for that purpose. Several of these are doing work of real pedagogic merit on a wide variety of subjects. In addition, individuals have arisen here and there who have made or sponsored the production of one or more films on a particular subject in which they were specializing. Such a film as *The Birth of the Dragon Fly* (U)* and the film explaining the Einstein theory of relativity are the work not of a company engaged in regular production but of individuals. These small groups have made some valuable contributions to the steadily increasing library of films of real pedagogic value.

It is obvious that the production and distribution of instructional films are the functions of organizations or individuals specializing in these efforts and can not apparently be handled properly by theatrical companies. The latter seem to have little sympathy with the school angle, are not possessed of the point of view necessary for success in cooperating with schools and seem to find the profits in the school business not large or rapid enough to suit their investment requirements.

In fairness it must be said that their point of view has largely been borne out by experience. A well-known producing and distributing company which pioneered in the educational field and produced a number of worth-while and successful films highly commended by the non-theatrical user has abandoned the educational field after a comprehensive study of the

* Wherever practicable the distributors of films mentioned in this book will be indicated by initials, the key to which will be found in the appendix, together with the addresses of the distributors referred to.

situation and consistent trial and effort lasting over a period of several years.

"It simply does not pay to try to meet the needs of the non-theatrical exhibitor," said an officer of this company, discussing informally the educational film field.

"The non-theatrical exhibitor is usually a poor business man, he is unreliable, far from a steady customer, he does not know what he wants, yet he is dissatisfied with what has been produced, or else he wants us to produce a film according to his ideas to meet his needs without stopping to consider that such a film might meet the needs of no other user of educational films. In addition, his equipment is often poor, he damages the film far more than does his theatrical neighbor, and yet is willing to pay less than a fifth of the price the theatrical exhibitor expects to pay. It is because the non-theatrical exhibitor wants everything for nothing or practically nothing that we have abandoned, at least for the present, the non-theatrical field. The few dollars which the relatively few non-theatrical users of films are willing to pay for films are not worth bothering with. We have found from experience that it simply does not pay to pass the films over the counter to these customers, and it will not be a paying proposition until the demand for educational films increases from about 400 requests per day scattered throughout the entire country to about 4,000 concentrated in key centers."

The foregoing comment on the educational film situation coming from a well-known producing and distributing company is significant. It is a severe but in many cases a true indictment of the non-theatrical user of films. It is the user of films here described that hinders rather than helps the cause of visual education. The cause can be furthered by business-like methods on the part of educators using films and their willingness to pay fair rental prices.

Two other of the largest theatrical film companies started educational departments, one, the big Famous

Players-Laskey Corporation. Both employed men of acknowledged ability to carry on the work but abolished the departments after several months' experience because these departments did not pay for themselves.

Educational departments have recently been established by two other large companies, Pathé and Fox. These have devoted their non-theatrical efforts mainly to renting the more suitable of their theatrical productions to the non-theatrical customers and seem to have made comparatively little progress in the production or compilation of films designed for instruction.

It is only fair at this point to let the theatrical film industry speak for itself with regard to the production and distribution of pedagogical films. Hon. Will H. Hays, President of the Motion Picture Producers and Distributors of America, said at the 1922 meeting of the National Education Association at Boston:

> On behalf of our organization I offer to your association all of our facilities to aid in your experimentation. There is already a great demand for pedagogic pictures. I propose that we jointly study that demand and that we jointly find ways and means of supplying it. Let a committee be appointed of this association made up of the very best talent within your ranks; let them meet with the great producers of the country and find ways to use our facilities. We ask you to aid us and let us aid you in the study of the whole problem of the use of motion pictures as a direct pedagogic instrument. Let us together find the means of making classroom pictures which are scientifically, psychologically, and pedagogically sound. Not only can we take care of the demand which now obtains; but the great demand which is imminent, and which will certainly come, must be met by producers with a supply that measures up to the ideas of the educators of the country.

And later he made the following statement:

> With the National Education Association and the Federal Commissioner of Education we are now engaged in the study

of the efficacy of the film in the classroom and in working out the arrangements to make certain the production of pictures for classroom work which will be pedagogically, scientifically and psychologically sound.

Although this sounds encouraging for the future, attention should be called to the fact that the big theatrical companies represented by Mr. Hays and whose organization is thus promising the production of pedagogical films are not the ones responsible for the bulk of the pedagogical films, some of very excellent quality, now available for schools. It has been the small independent educational producer who has made the large majority of the pedagogical films now being used in instruction and from whom we may continue to expect films of real merit in the future.

Whether or not these statements and plans of Mr. Hays presage actual production of pedagogical films on a large scale by the theatrical film companies, they do make it quite evident that the leaders of the industry generally realize that the educational film is to become a very prominent factor in the motion picture world.

Non-theatrical Companies

In film production, as in book publishing, the manufacture and distribution of a product for the use of schools seems to demand specialization. It is for this reason that such commercial companies have arisen and are progressing as The Society for Visual Education, Inc., National Non-Theatrical Motion Pictures, Inc., Community Motion Picture Service, Carter Cinema Company, Visual Textbook Publishers and other similar organizations, which are devoting themselves exclusively to the non-theatrical field of pictures.

It has been mainly through the efforts of such companies as these and of many of the state universities, the Federal Government and some of the large manufacturing companies, that even now a fairly large quantity of acceptable instructional film is to be had. Films on commercial, physical and general geography, zoology, literature, civics, agriculture, hygiene, surgery and to a lesser extent chemistry, botany, history and physics are available.

Some of these have been produced primarily for school and church use. The major portion, however, was originally made for theatrical use but have been found suitable also for educational purposes. In many cases such material has been re-edited to make it suitable for the school and other non-theatrical use. We shall have much to say regarding re-edited film later. Most of the films of greatest instructional value, however, are those being made primarily for instruction. Some of the foremost educators in the country are devoting their time to such educational pictures and members of the faculties of some of our great universities, such as Columbia and Chicago, are coöperating with experienced film producers in building pictures paralleling standard courses of study in our schools. Perhaps the most conspicuous and promising example of these pictures are the films on the history of the United States, now actually being produced by the Chronicles of American History, Inc., in association with Yale University Press.

Production in Educational Institutions

It is interesting to note that ten great Universities have been or are now directly or indirectly producing motion pictures. They are Yale University, already

mentioned, Chicago University, the Universities of Illinois, Indiana, Iowa, Oklahoma, Michigan, Nebraska, Wisconsin and Utah.

The United States Naval Academy at Annapolis has produced analyses-of-motion films on Boxing, Wrestling and Swimming (NN-T) for use in physical instruction.

The State Department of Public Instruction at Raleigh, North Carolina, has produced a film history of the State. The University of Nebraska has erected a $20,000 motion picture studio on its campus.

Distribution Problems

One of the most troublesome problems in the introduction of visual instruction has been that of film distribution. It is an even greater problem today than that of film production, for of what use are the thousands of excellent pictures that may be in the vaults of producers in New York if the user of films in Texas or California can not obtain them? Although the problem of exhibition or utilization of the motion picture in schools is what we are most concerned with in this book, the problem of distribution has a vital bearing and is of concern to all who are using or who may desire to use films in education. Independent educational producers have been unable, because of the lack of an adequate system of national non-theatrical exchanges, to circulate their products to various parts of the country except at prohibitive expense for transportation and with unreasonable loss of time. In the attempt to meet this difficulty there are growing up here and there through the country local educational distributors of motion pictures who are offering to both producers and users more or less satisfactory

facilities for the local handling of educational film product.

Probably the largest non-theatrical distribution factors up to this time have been the extension departments of various State Universities or institutions of similar character. The following institutions are distributing films in their respective states: The Universities of California, Colorado, Florida, Indiana, Kansas, Kentucky, Minnesota, Nebraska, Ohio, Oklahoma, Oregon, Texas, Utah and Wisconsin; the Iowa State Agricultural College, the Illinois Agricultural Association, the Kansas State Normal School, the Louisiana State Normal School, the Department of Education of Massachusetts, the Mississippi Agricultural and Mechanical College, the Bureau of Community Service of North Carolina, the North Dakota Agricultural and Washington State College.

Such of these institutions as the Universities of Wisconsin and California and the Iowa State College have large film libraries and are accomplishing considerable distribution, while many others are making a rather futile attempt. Ten or more of these institutions operate visual instruction departments which circulate motion pictures to non-theatrical exhibitors within their respective states. The service offered is, in most instances, rather a community than a school service and designed primarily for entertainment rather than instruction. However, many valuable pedagogical films may be secured from these state distributing centers and some give special attention to supplying school needs. Some of the films produced by and for the Federal Government may also be secured through the state universities and agricultural colleges. The work being done in North Carolina in

teaching whole communities by means of films is so unique that it is worthy of mention here.

The Bureau of Commercial Service, which later became a division of the State Department of Education, was organized in 1916 under a voluntary arrangement entered into by the State Departments of Education, Health and Agriculture, the State College of Agriculture and Engineering, the State College for Women and State Farmers' Union. In 1917 the legislature appropriated $25,000 for the work "designed to improve social and educational conditions in rural communities through a series of motion pictures selected by the Department of Public Instruction."

Complete portable operating units were organized, each having a lighting plant, projector, screen and other equipment mounted on trucks. Ten community circuits were started. Application for the service came from the county Board of Education. In applying for the service the community agreed to pay two thirds the cost while the state paid one third. To raise their share the community charged a small admission fee which, in most cases, was sufficient to meet expenses. Where there were ten community centers holding two meetings a month, the work in a short time grew until there were twenty county units holding 400 community meetings a month with an average monthly attendance of 45,000. In one mountain county not over forty in the first audience of 280 had ever before seen a motion picture. And in the remote mountain sections people often walked for eight or ten miles to attend a meeting.

Each program given usually consisted of six reels made up from comedy, history, literature and agricultural subjects of both general and local interest. The Department began at once to collect its own film

library and in four years' time owned over 800 films. In addition to purchasing, the Bureau started producing films of local interest, showing the best and poorest schools, homes, farms, roads, livestock, etc. These "county progress" films, as they were called, were first shown in the communities in which they were taken, sent around the circle and then placed in the state's permanent film library. One writer, referring to the venture, said:

> North Carolina has scored a visual success. It is sure to spread, for there is no finer way of getting a grip on rural folk and increasing their content with country life. By concerted effort the best type of educational and recreational films can be brought to brighten the lives and widen the horizon of young and old even in the most remote sections of our country.

While the country should properly look to the State and Federal Governments to assist and encourage all worthy educational undertakings, we believe that it will be the responsibility of the commercial field to supply the bulk of educational materials, as it has in the past, and this applies to motion pictures as to other materials of instruction. Because of the peculiar nature of the undertaking, the great initial cost of producing films and the consequent need of large buying power, the demand for facilities for transferring film supplies from one locality to another to meet shifting needs and other considerations, the solution of the problem of instructional film distribution would seem to lie with the companies prepared to establish and maintain national systems of exchanges devoted exclusively to supplying films to the non-theatrical field. At this writing at least one such movement is under way. No doubt other firms will soon follow the example set.

(U S Department of Agriculture)

A FLOCK OF WILD DUCKS

Not only will such distribution systems place films within reach of schools everywhere but will promote and encourage the production of additional pedagogical film by affording its producers a profitable outlet. There is bound to grow out of this effort and in response to an incessant and ever-increasing demand from users means of placing available educational films in the hands of those who need them. This in turn will be such an encouragement to producers as will greatly stimulate supply. The ball is already rolling, has acquired considerable momentum and needs only a reasonable time to reach its destined goal.

Retarding Factors

Lack of an adequate supply of suitable educational films, doubt as to the character of projector to purchase, unreasonable and lack of uniform legislation regarding the use of films in schools, lack of sufficient funds with which to purchase projectors and films, lack of proper coöperation between the users, producers and distributors of educational films, lack of architectural provision for motion pictures in school buildings and the conservatism of educators are some of the factors which have retarded the demand for and the use of motion pictures in instruction.

Despite these factors, the use of the cinema as a supplement in school work has developed remarkably in the past few years until now it has become conclusively evident that films are to be an important and an essential part of school work and that in the near future no well equipped and efficient school will be without a projection machine and an adequate appropriation for films to correlate with class work.

Visual Instruction Departments

Already many of our most modern and efficient school systems have visual instruction departments with supervisors in charge. Such is the case in Atlanta, New York City, Chicago, Evanston, Kansas City, Detroit, San Francisco, Berkeley, Oakland, Los Angeles and Newark. Provision is made in these cities for funds for the purchase of motion picture projectors and for the purchase or rental of films. Many other school systems which have not as yet instituted visual instruction departments and numerous individual schools in all parts of the country are utilizing motion pictures for instruction.

Visual Instruction Associations

The schools of New York City were the first in which the use of films actually conformed to the course of studies, and such of the New York schools as are thus using films pedagogically are setting a pace and a standard for other schools of the country. We invite a challenge to this statement. We have made it in good faith and believe it to be true. Much of what New York City has accomplished in this regard has been owing to the active coöperation and splendid spirit existing between the teachers and the educational film producers and distributors. Under the able leadership of Dr. Ernest L. Crandall, Director of Lectures and Visual Instruction, Board of Education, the Visual Instruction Association of New York was formed. In this association the several factors essential in the upbuilding of this movement, film producers, distributors and users, united their efforts on an equal footing. This body, through its various committees, has become a clearing house in which producers and dis-

ributors learn the needs of the users of visual aids; eachers learn the limitations and difficulties of pro- luction and distribution; competing film makers and sellers of films and equipment learn to cooperate to heir common good and all work together for the best nterests of the school.

Out of the New York Visual Instruction Associa- ion there was born at the Boston meeting of the Na- ional Education Association in 1922, the Visual In- struction Association of America, founded to perform on a nation-wide scale a function similar to what the New York body has performed with marked success locally. The National Association has in each State a vice-president, one of whose duties is to build up local units in his territory.

Another and older association, the Academy of Visual Instruction, contains in its membership practically all of the directors of visual education in the state colleges and universities as well as other educators. Active membership in the Academy is restricted to those interested in visual education who have no commercial affiliations. The Academy declares that it is interested in the intelligent furtherance of visual instruction in all institutions employing visual aids and includes among its purposes the use of films for community entertainment.

Educational Film Magazines

There are two magazines devoted entirely to the non-theatrical field, *Educational Screen* and *Visual Education,* the latter confined almost exclusively to school work. Other educational motion picture periodicals which did valuable pioneer work but have since suspended publication are *Reel and Slide,* later *The*

Moving Picture Age, which in turn has been absorbed by *Educational Screen*, and *The Educational Film Magazine* and *The Screen.*

Growth of the Movement

One important indication of the growing place being accorded motion pictures in instruction is that nineteen of our large educational institutions having normal departments for teachers' training are giving or have given some instruction to their students on the use of motion pictures for visual instruction.

No less an authority than Dr. John J. Tigert, U. S. Commissioner of Education, has said:

> I for one am convinced that for the future the motion picture is to forward our campaign against illiteracy as nothing else that has been adapted to the classroom. No one can long stay the general introduction of the film into the school.

Certainly the day of the educational film is dawning and the prophecies of those early inventors and investigators of motion pictures are about to be realized. It was Thomas A. Edison who said, "My opinion is that in time the schools will be the principal users of moving pictures." And Dr. Marey, in 1895, when the motion picture was truly in its infancy, stated that this new medium seemed likely to extend our knowledge with regard to all kinds of phenomena. "But its future," said this pioneer investigator, "depends upon the correction of the distortion of the image, on the discovery of a satisfactory means of projecting a much larger number of moving images on a screen so as to be visible to a large assembly and on increasing the number of successive photographs so as to present a performance of considerable duration." Marey did not foresee that the realm of entertainment would be

interposed between the wonderful advances in the cinema for which he was so largely responsible and the complete fulfillment of his vision. Every one of the requisites which he laid down as necessary of accomplishment before the cinema should perform its full educational function have been fulfilled and more. The enterprise of the very entertainment world whose interposition he overlooked has added refinement and technical development to the art. His dream has come true and the day is breaking for instruction through the motion picture, the greatest single element for the advancement of learning since the invention of printing.

III

OBJECTIONS TO THE USE OF MOTION PICTURES IN EDUCATION

Despite the advance made by the motion picture, educators are far from unanimous in approving their use in education. The actual proportion of schools using them is exceedingly small at the present time, only a small part of one per cent.

In reply to a questionnaire sent out by the U. S. Bureau of Education in 1920 only 1,513 schools and colleges replied that they were using films in any form. Although this was a long time ago in the annals of the cinema, and only 10,000 answered the questionnaire, it is highly probable that most projection machine owners who received the questionnaire replied. It is evident that motion pictures have a long way to move before they can be said to be a controlling factor in our educational system.

An editorial appearing in the *New York Times*, July, 1921, on "Education by the Movies," makes the point that

> At best the current history, science and travel that can be flashed upon the screen is a smattering. Really to understand such things requires reading, study, laboratory demonstration. Princes have found that there is no royal road to knowledge and Americans may as well learn that it can not come via the armchair. [And this much discussed editorial speaking of the modern photoplay continues.] As compared with the novel and spoken drama, the moving picture story has certain obvious advantages. It is more swiftly graphic,

more vivid and immediate in its appeal. But by the same token its range in subject matter and characterization is narrower. It tends inevitably toward the familiar, the unconventional, the stereotyped.

The child who gratifies his love of stories by reading enlarges his vocabulary, stimulates his power of imagination, multiplies his points of contact with human nature and sensibility. That and not the facile delights of the silver screen provide genuine education. Children brought up on the movies too often lack patience to read, the sense of verbal beauty, of lifelikeness in character and are rather inclined to patronize those others who spend long evenings to encompass the story which the moving picture tells in a few minutes.

And a New Jersey daily, discussing "Movies in Schools," says editorially:

The motion picture companies have produced thousands of most educational films. Many subjects may be taught better with motion pictures than by lectures or lessons On the other hand fundamentals can not be taught with pictures. Visual education is incidental and has the *demerit of cultivating intellectual slothfulness* The textbook, the lecture and the lesson will continue to be the basic means of imparting knowledge and training the mind to function.

That films make superficial thinkers and that they do not stimulate the imagination were opinions advanced at a recent discussion by High School teachers. One teacher said:

I think moving pictures over-develop the appeal to the sense of sight and that on the whole their effect is psychologically bad There is too great an appeal to vision and the other senses are neglected. Besides, pictures inspire a discontent with life as it is and tend to make one seek "movie life" where action is quick and results quicker.

Another teacher in the same group had this to say against movies in education:

I am convinced that so far as school children are concerned, the motion pictures of today are more of a detri-

ment than a help. One of my English pupils told me that the movies helped her so much in her book report that she did not have to read the book! The mere depicting of the incidents (and how frequently the episodes are changed) robbed that student of the benefits to be derived from reading the book in question.

So many and so extravagant have been the claims advanced for motion pictures in education that it is not surprising that editors and educators have frequently arisen to protest.

The State Superintendent of Schools of Maryland wrote to the *New York Times* to say:

> If the movie is more powerful in educational influence in America than the school, as Commissioner Tigert is quoted as saying, then we are wasting millions of dollars a year on the dull prosaic teacher-pupil system when we could turn our schools into movies and absorb education by sitting and enjoying ourselves. It is quite true that the movies make a deep impression on the child at times but there is nothing that can replace the teacher-pupil method of education.

The disadvantages of the film are summed up by C. E. Turner, Mass. Institute of Technology, in an article "An Evaluation of Visual Education," as follows:

> Seeing may do away with the necessity of doing; films amuse; they make education too easy. Motion pictures use so much fake photography the pupil will not believe anything he sees in a film, and—they cost too much.

A speaker at the National Education Association meeting held at Cleveland, 1920, summed up the drawbacks to the use of films in school work as:

> eye strain, the flickering light being hard on the eyes; fire hazard, the electric current required might prove dangerous and inflammable, so this puts it under the ban by insurance interests and an expensive housing is required which re-

stricts the use of films to auditoriums and takes them out of the reach of the class. In addition films are expensive and made primarily for entertainment or advertisement and the whole matter up to the present seems like an exhibition of misfit effort.

A writer in *Life* goes further, saying:

Motion pictures have revealed themselves the most effective carriers of idiocy that the civilized world has known. They have lurked near school houses and seduced the impressionable minds of the children. They have bought literature and converted it, by their own peculiar and esoteric magic, into rubbish.

And in the *Outlook* we find this diatribe under the title "The World's Worst Failure":

The movies have borrowed historical episodes and failed to illuminate them; have ransacked granaries of drama and fiction and borne off more often the chaff than the wheat; they have turned Thalia into a hurler of custard pies, dressed Terpsichore in a one-piece bathing suit and in pursuit of Melpomene treated the world to unpremeditated tragedy. Such real characters as movies have portrayed have generally been filched from printed books and been marred in the filching.

And in *The Bookman* we find one of the young intellectuals, with the courage of his convictions, saying:

Not one scenario has been prepared in this country for a motion picture with a significant idea. In almost every instance where good novels and plays and short stories have been drawn upon for movie material, the ideas have been distorted and sentimentalized out of all recognition. And the very worst and most insipid of American fiction has been gutted for scenarios of widely advertised and patronized films. Stage successes such as "The Affairs of Anatol" have, on the screen become nauseating. It would seem that the most incompetent journalistic hacks, the most illiterate backwash of the writing profession, are retained to prepare the scenarios for American film production. Most of the reputable writers who have sold and contracted to sell the motion

picture rights to their work, have either ostensibly or actually taken the attitude that there is no help for the situation, that the movies are an institution by illiterates and for illiterates and pocketed the easy money.

While some of these indictments are directed not against educational films but against photoplays, they are quoted for the reason that they have an application to the entire field of motion pictures and should be considered even in an evaluation of educational films.

Objections

The following is an attempt to summarize succinctly the more important objections to the use of films in education:

1. Films cause eye strain.
2. There are too many mechanical difficulties and projection problems, including proper wiring, current, etc.
3. Fire hazard.
4. It costs too much to install the equipment and to buy or rent films.
5. Films make learning too easy. They substitute entertainment for instruction and passive acceptance for active effort in learning.
6. They make superficial thinkers.
7. They reduce reading.
8. They destroy the sense of perfection in language.
9. They dull the imagination.
10. The introduction of films into a lesson causes distraction.
11. Films tend too much to replace the teacher-textbook method of instruction.

12. Slides and still pictures are better.
13. Proper films are not available.
14. Films that are available are too frequently inaccurate, untrue, vulgar or crude.
15. Films are too rapid.
16. The benefits to be derived are uncertain and unproven
17. There is no established method of use.

This is a formidable array of objections, which we shall consider in detail.

Eye Strain

Eye strain deserves the fullest consideration but does not at this stage of development enter into the discussion of pedagogical adaptability of the films. Eye strain from moving pictures may be caused by faulty projection, old or badly scratched film, or weak or defective eyes. The problems of keeping the projector in good order and in proper adjustment and seeing that it is operated by a competent person are constantly present and require attention. Users of films should carefully inspect all films furnished; if they come from the exchange on very old and bent reels they should be rewound on good reels kept for the purpose; old and badly scratched films should not be used, and the school should not continue to patronize the company which furnishes films in bad condition. This, of course, imposes another burden on the school.

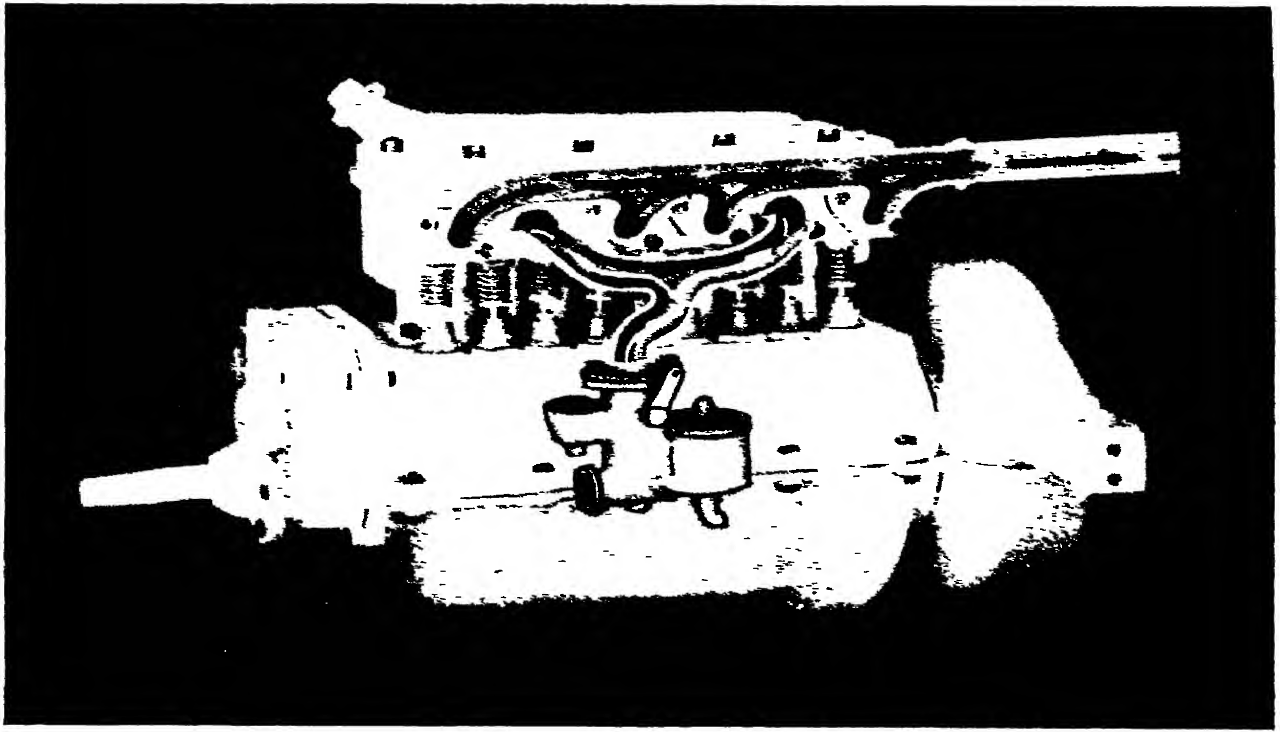
The most serious cause of eye strain, weak or defective eyes, is a problem of the exceptional child, not of pedagogical practices. It is one that the individual principal or teacher will have to meet,

Mechanical Difficulties

Mechanical difficulties, such as those having to do with current, wiring, booths, screens, securing the right kind of projector for a given hall or auditorium and the required permits from local fire and insurance authorities are brought forth as reasons why many schools are not using motion pictures. There are a number of such difficulties to be considered in installing films. To put films into schools *does* take time, trouble, thought and investigation and study of the several problems involved. A number of permits may have to be obtained. Copies of local rules and regulations governing the installing and projecting of motion pictures will have to be secured and studied. The subject of electric current available will have to be gone into, and a licensed electrician may be needed to see that the wiring is done according to local ordinances. Necessary fire extinguishers will have to be provided if inflammable film is used. The question of what kind of projector to buy and what kind of film to use will require investigation and study. The mechanical difficulties and problems of insurance have prevented many schools from installing motion pictures. We can advise no one to install films who has not considered these problems and reached some solution.

Fire Hazard

What of the fire hazard? We hear much of the danger of film catching fire and occasionally read of great film fires and explosions. What relation have these reports to the danger of fire in schools and the safety of children where films are used? These are exceedingly vital questions which should receive thor-



(Bray Studios)

MOTOR OF AN AUTOMOBILE IN ANIMATION

ough investigation before a decision to use films in schools is reached.

The ordinary motion picture film is highly inflammable. The film stock which carries the photographic emulsion is made of celluloid which has a nitro-cellulose base. There are two kinds of nitrates, the high nitrates, such as guncotton, which are highly explosive, and the low nitrates, of which celluloid is one and which, while it is not itself explosive, is highly inflammable for the reason that it contains free oxygen in its composition, and this enables it to burn rapidly in the air and to keep up slow combustion even where air is excluded.

Carelessly handled nitro-cellulose film is exceedingly dangerous. Let us quote what an officer in the Underwriters' Laboratories, New York City, says:

> From the very beginning of the motion picture industry the fire insurance underwriters took the position that nitro-cellulose films, being a highly inflammable article, should have all possible safeguards thrown around it, both when in use in projection machines and when not in use.
>
> The growing importance of the educational, religious, industrial and non-theatrical use of motion pictures makes it doubly imperative that the Underwriters, the State Fire Marshals and the local fire departments of our cities and towns should be on the lookout to protect the lives and property involved in such use of nitro-cellulose film. For years the proper safeguards have been thrown around its daily use in places of amusement. Why should not the same safeguards be demanded in schools, churches, hospitals, asylums, prisons, manufacturing plants and other institutions?
>
> The danger is not so much in the machine itself—many of the portable machines are safe enough within themselves—but in the handling of nitro-cellulose film outside of the machine. Furthermore, all devices which are designed to make the handling of hazardous film less hazardous within the machine and outside of it, which do not comply with the laws, are merely evasive and do not meet with the approval of the underwriters.

Portable projection machines using the regular theatre film, without booths, competent operators, and the other fire-preventive provisions of the law, are unquestionably a menace to life and property.

The future of the non-theatrical field of motion pictures, if it is to depend upon portable or semi-portable projection machines largely, lies apparently in the broad development of the safety idea in machines and film libraries.

The Question of Expense

Film and film equipment are among the most expensive of visual aid materials The cost is higher than for slides, charts, graphs, models or still pictures. Questions the school superintendent or principal should ask are: Do motion pictures justify the money invested in them? Will it pay us to install them in this school?

At the present time satisfactory projection equipment costs from two hundred to two thousand dollars, depending upon the type of machine desired and the additional equipment needed. Films rent at from one to ten dollars and even higher per thousand foot reel per day, with an average film rental of about four dollars per reel per day. Prices vary greatly. A program or series of programs for a term or whole year are proportionately less and usually range from fifteen to twenty-five dollars for a six or seven reel program. The purchase price of films varies so greatly that one writer is quoted as saying films could be purchased at from five to ten dollars a reel for "junk" or used film, with the sky as the limit. Prints of the U. S. Department of Agriculture films, for example, can be purchased for about forty dollars per reel, certain educational films have been quoted at one hundred dollars a reel, while others are not for sale at any price and can only be rented.

One school principal, who had not investigated local rules, ordinances and insurance rates before purchasing a projector, answered the question—"Has it paid us to install films in our school?"—in a most decided negative. He says:

> We find that we cannot operate our machine at all unless we are willing to pay an extra insurance of over $600 per year which of course is prohibitive. Consequently we have a nice white elephant on our hands. You can believe me, I wish I had never heard of a movie machine in a school. After spending hundreds of dollars we find that we must put it away as a bad venture.

And such has been the experience of more than one would-be user of films. In many cases local rules and regulations regarding the use of films make them prohibitive for schools under certain conditions.

Films Make Learning Too Easy

The comment is frequently made by educators that films amuse; they make education too easy; seeing may do away with the necessity of doing. Interesting criticisms of the use of films in education were made by speakers addressing the first class in Educational Motion Pictures, Columbia University, Summer Session, 1921. One speaker, a prominent school superintendent, said:

> Films do not teach concentration, but rather the contrary. They confuse because of their variety and continual motion. The only function of the motion picture in education is to gather together facts and summarize them.

A former officer of the National Federation of College Women, writing on "Some of the Pitfalls," makes the point that the movie has created in the child a distrust of itself. The wonder and credulity that are

supposed to be essentially childlike characteristics are fast disappearing. And a professor of English says:

> Failure lies in making a toy of the motion picture in the classroom, using it to replace effort on our part or on the part of the pupil. Mere quickness hampers us in gathering accurate facts and details.

Other writers and observers maintain that the cinema may prove harmful instead of helpful because a fundamental principle of pedagogy is that the pupil should learn by dint of laborious study, that there is no royal road to learning, and that by our effort to simplify and facilitate the acquisition of knowledge we make the school superficial and detract both from imparting useful knowledge and the building of character which the struggle for knowledge engenders. Knowledge is like a rich metal embedded deep in the earth and which has to be dug for as a miner digs for gold. The tendency of the modern school, they tell us, is altogether away from the older ideals of hard work. Everything is being simplified for the child, made easy and pleasant, and the pedagogical film is just another step in the same direction, all tending to substitute play for work and thereby depriving the school of its greatest asset, personal effort.

Another phase of this consideration is that the child of this generation regards the motion picture so definitely as entertainment that when the picture is introduced into the classroom he must persist in still regarding it as recreation rather than material for serious application. This is pointed out as scarcely the disposition requisite for earnest attention and effort to learn which should be present in the classroom. It is a question whether motion pictures, both because of their antecedents and because of their essential char-

acteristics, can ever overcome their primary appeal as recreational rather than as instructional material.

Films Make Superficial Thinkers

The objection is made that films produce superficial thinkers, dull the imagination, destroy the sense of perfection in language and reduce reading. Examples have been cited where pupils rarely do parallel reading if they can see the work in question in a "movie." It is also true that many entertainment films and some instructional films make no demands on the mentality of the beholders. If a pupil is allowed to replace the reading of the classics with seeing a film portrayal he will have only half a knowledge or a distorted one of the subject and the result will be harmful. No one can intelligently discuss a book or a play merely from having seen the screen version. Without a knowledge of the original it is impossible to know how truthful the motion picture producers have been in their translation.

Discussing "The Motion Picture and English Literature," a professor of English at Brown University writes:

> If in general it is dangerous to supplant books by motion pictures it is trebly so in literature. A motion picture can give only the facts of the case in action plus whatever elemental emotion these facts generate. If the motion picture accentuated the habit of thinking in bits it would be not a help but a menace. The best part of a novel can not be transferred to the screen. A coarsened, syncopated representation of the plot (as in *Treasure Island*) can be given, but that is all.

Another teacher advances the opinion that

> motion pictures do more harm than good in the study of the classics, for the pervading soul of the author is lost and the original is gone.

Films Reduce Reading

That the movies reduce reading is a contention often made. A librarian writes:

> The movie is moving the boy away from good literature. Once he develops the movie type of mind he will be lost forever to good books. The repose and repression, the atmosphere and the background that are part of all good books, will bore him. In motion pictures the boy finds nothing that calls for the exercise of his mind. He becomes in a sense the father of the mentally sterile man. The motion picture simply asks for his eyes, never for his intelligence. And so he passes in time completely away from the field of books.

Films Cause Distraction

That the introduction of films into a lesson causes distraction and that the darkness causes disorder are objections that have to do with discipline and teaching methods rather than with the medium used. However, these objections are raised as very serious factors by teachers who maintain that pupils in the grades will not behave or be attentive when darkness hides them from the wachful eye of the master. Furthermore, the unusual condition introduced by the necessary darkening of the room causes, they claim, a distraction which more than offsets the advantage gained by the showing of the pictures.

Films versus Teacher and Text

State Superintendent of Schools Cook of Maryland, previously quoted, is quite correct in saying that there is nothing that can replace the teacher-pupil method.

The personality of the teacher, his acquaintance with the qualifications and shortcomings and idiosyncrasies of the individual members of his class and his direct and personal interest in them can not be replaced

by any pedagogical device, however skillfully designed. It is as inane to suggest that the cinema will supplant the teacher as that it will take the place of the textbook, as Thomas A. Edison is quoted as having predicted. The combination of the textbook, teacher and pupil can not successfully be supplanted.

One of the outstanding weaknesses of the film as known today is its tendency to relieve the teacher of much personal effort, and while this may be pleasant for the teacher, it is not good for the class. In using lantern slides the teacher has opportunity and occasion to talk upon them. To do this requires that he know the subject covered by the pictures and that he inject his own personality into the picture lesson. This means in turn that he will naturally take more interest in the slide lesson, familiarize himself in advance with the pictures and be better prepared to discuss them than in the case of the film, whose sub-titles make it self-sufficient and defeat rather effectively any attempt at lecturing or explaining while the pictures are being shown. If this be true, is not the use of film less apt to gain the support of the earnest, enthusiastic teacher? For that is the kind who desires active participation in all activities of his class.

"Still" Pictures are Better

An objection that deserves special consideration is one frequently heard from many visual educators—namely, that the slide, the stereograph or the still photograph will do all that is claimed for the motion picture and will do it better, without causing eye strain, without danger from fire, and with much less expense. These champions of still pictures tell us that slides are

available in greater quantity, more easily obtained than films and have the added advantage that as few slides as desired or needed to illustrate a given point may be used, while in the case of the film the whole subject has to be shown whether or not the entire reel is suited to the lesson being studied.

The case of the slide versus the film has been ably set forth by one slide enthusiast, E. R. Barrett of the Kansas State Normal School, who sums up the case as follows:

> The still picture stays in sight just as long as the teacher may wish. It may be returned to view instantly. It may be shown alternately with other pictures for sake of comparison. Of still objects like the Capitol at Washington, a banana tree, the Panama Canal, etc., a more comprehensive view may be obtained from still than from moving pictures. The range of subjects that may be shown from slides is infinitely greater. When motion pictures are used in the classroom the picture determines largely what shall be taught, but with the slide the subject determines the picture Operation of the new stereopticon is as simple as turning on the electric light and adjusting an opera glass. Many schools make their own slides and they can be bought at from twenty-five cents up.

And the principal of a public school, resenting some of the claims made for the film in education, writes to the editor of the *New York Times* rather heatedly as follows:

> Five years of experimenting with the moving picture and the stereoptican have proved the greatly superior advantage of the still picture, and pictorial aids of any kind are being used with more and more moderation because of the evidence that much of the instruction so given (or rather offered) is accepted merely as passive entertainment. I am glad to have the facilities for pictorial instruction and know the value of their occasional use, but the general public, and much of the educational world, has gone mad over the new and easy way of pouring instruction into the waiting child.

Mr. A. W. Abrams, chief of the Visual Instruction Division of the New York State Department of Education, and a recognized authority on the use of the slide in education, in a letter to the writer says:

> We are circulating this year something over half a million slides, but we are doing nothing whatever by way of furnishing motion pictures, though I suppose we are giving at least as much attention as any bureau to attempts to determine the value and limitations of the educational type of picture. The thoughtful school administrators and supervisors, who have the responsibility of directing the work of our teaching institutions, are not yet very thoroughly impressed with either the character or the great importance of visual instruction, particularly when that term is made synonymous with motion pictures.

And in a published article Mr. Abrams makes these statements which are worthy of serious consideration:

> A motion picture consists of a succession of images projected on a screen from a film with such rapidity as to produce the effect of movement. The chief function of such pictures is to tell a story. They are not well adapted for the observation of any of the aspects of material things other than motion. The distinctive place of the motion picture is in the field of entertainment, though it may have some supplementary educational value in showing processes when other related facts are known. There is no possible advantage to be derived from the motion picture for representing objects that are static, such as buildings, works of art and physiographic features of the earth. Motion is sometimes so characteristic of a living form of mechanical contrivance as to be in itself an object of interest and when the moving form can not be examined a pictorial representation of the movement is distinctly useful.
>
> For educational uses, aside from the question of expense, the chief weaknesses of the motion picture are the absence of discussion while observation is going on and a consequent lack of training in observation and in the power of verbal expression. The deeper and more significant features to be observed are overlooked, true mental reaction is weak, and study is superficial. The same results may attend the use of still pictures but are much less likely.

Proper Films are Not Available

There is much truth in the statement that suitable films can not be obtained by educators. Dr. John J. Tigert, U. S. Commissioner of Education, writes in *School Life:*

> The whole matter of producing proper films for school purposes has been at a deadlock because the producers who were commercially successful did not understand the needs of the school, and school men, on the other hand, who have undertaken to produce, though understanding the educational problem, did not have the practical experience which is necessary for success.

Not only have comparatively few satisfactory educational films been made specifically for the teacher's needs, but those that he could adapt to his purpose are not to be had if he lives any distance from a few large film centers.

The educator living in Maine, Florida or New Mexico may find that the film he wants can only be obtained from New York and the cost of transportation, plus film rental, plus time in transit, discourages him.

Practically the entire attention of the motion picture industry during the past quarter of a century has been directed toward providing films for public entertainment in the theatre, and it is not surprising if the producer has not found it profitable or attractive to turn his attention to educational films. Certainly there has been little or no profit hitherto in the handling of educational pictures, and comparatively few producers have had the ability to provide motion pictures of instructional value even if they were so inclined. In fact, from specimens upon the screens of some of our theatres, few picture makers seem capable of producing worthy examples of even the dramatic art. As

for the so-called "educational pictures" frequently shown in our better theatres and which contain many gems of value pedagogically, even these are largely a drug upon the film market and few find it profitable to make or sell them. Certainly, compared to the vast number of photoplays and comedies that are being produced yearly, there is an almost infinitesimal percentage of true pedagogical pictures, and those which do exist, owing to the lack of adequate systems of distribution, are not easily accessible to schools outside of a few big cities like New York or Chicago. The Board of Education of Los Angeles, for example, has been striving for months to obtain the Burton Holmes travel films for use in its schools but thus far has found it impracticable to use many of them because they can be got only from New York. It is to be regretted that an art conceived in educational endeavor should, after thirty years, have fallen so far short of adequate pedagogical accomplishment.

Films are Inaccurate

That films that are available are too frequently inaccurate, untrue, vulgar and crude is a criticism that contains much truth.

The early efforts of any art are apt to be crude. Early attempts at painting can truthfully merit all the epithets enumerated above. The products of many early masters of the Christian era were ludicrous expositions of ignorance of human anatomy. The sculpture unearthed from the ruins of ancient Babylon, while amazing manifestations of the advance of the art of that period, can scarcely be considered altogether satisfactory representations of their subjects. And the motion picture is no exception. The minds direct-

ing the motion picture industry have naturally not long been schooled in their calling. The cinema has as yet no traditions to live up to, no principles to adhere to and has received into its fold many who were failures in the callings they hitherto followed. The writer in *The Bookman,* already quoted, says:

> The motion picture industry has behind it a vast deal of shrewd and adventurous business acumen but not one influential directive mind above the level of a stock promoter, not one guiding personality who has revealed more than a glimmer of æsthetic interests or even of elementary taste.
>
> Whether the movies in this country will ever attract the first-class artist is problematical. The field is held at present by ex-chauffeurs and ex-scene shifters who summarily reject all constructive criticism and are hostile to all ideas which they stigmatize as highbrow. It is to their interest, obviously, that the movies remain the tawdry claptrap they are, sentimental and vulgar episodes in settings which are anachronistic, flashy, ludicrous, and absurd.

If these invectives be true, it would most naturally follow that the attempts of these same near-artisans to produce pictures of educational character would be even greater failures And, in fact, many films which the writers have had submitted to them as pedagogical had not as much instructional merits as a dime novel or the comic section of a modern Sunday newspaper.

Films are Too Rapid

We are told that motion pictures move too rapidly, that no sooner is an object seen on the screen than it is gone, before the spectator has opportunity to grasp it, that scene follows scene so quickly that the mind can not intelligently follow and that the effort of the child to follow is too great a strain. What habitué of the "movies" has not suffered from motion pictures running at top speed? If this is an essential limitation of

motion pictures, their pedagogical value is thereby seriously lessened.

When one realizes that the pupil seeing motion pictures is seeing sixteen distinct images a second and about sixteen thousand in fifteen minutes and that the images are constantly being withdrawn to make place for explanatory titles which the child must hasten to read before they disappear, the criticism that the film is too rapid and that the child can not take in all he sees might appear to be a just one.

In the course of an article on "Some Psychological and Pedagogical Aspects of Visual Education," Matilde Castro, Professor of Education, Bryn Mawr College, writes:

> The ordinary motion picture even of the less exciting type moves too fast usually for mental assimilation and the nervous anxiety is often great because, as a child, remarked "I just never can keep up with where things are coming next."
>
> If this is the sort of quickening and vitalizing process which the motion picture purposes to apply to "dead" subjects of the classroom it is pernicious not merely because of the bad hygienic effect upon the child, but because any condition of tenseness or anxiety is detrimental to learning. Further, this tempo is bad for memory. Impressions following each other in very close sequence tend to weaken the preceding ones. . . . Even when the proper use of films is understood there will always be an individual problem as to how many and at what intervals exhibitions should be given to a particular class.

Another point worth considering, made in the same article, is that

> the motion picture does not by virtue of the fact that it presents movement and activity avoid passivity on the part of the child. His attitude may be far from that of giving dynamic attention. He may be so concerned to let nothing escape his attention as the procession files by him that he

inhibits any tendency to think lest it get in his way. Or the mental alertness may be one of strain and tension, of being on the jump in order to keep up the pace of the necessary eye adjustment.

Benefits Uncertain and Unproven

No one knows wth certainty what motion pictures are capable of accomplishing in our schools, for the very simple reason that they have not been thoroughly tried out. True, earnest experimenters have conscientiously determined the exact percentages of learning which come to the child through the eye, the ear, the nose, the mouth, the skin (see *Educational Screen*, Dec., 1922) and we have learned very conclusively and definitely from their tests that the eye transmits to the mind, under various tests, 40%, 46%, 85%, and 90% of the sum total of mental acquisitions and that, for example, motion pictures are exactly 2% more or less efficient (we forget for the moment which) than a certain type of teacher; but beyond such discoveries the world really does not know either how to use the cinema in teaching or what good it would accomplish if it were used.

Even the tests referred to have been conducted, for the most part, by student investigators who chose or had imposed upon them as their thesis the subject of motion pictures in education and might naturally feel called upon to build up a case for them, or by visual instruction experts who might be excused if they were somewhat prejudiced in favor of their own chosen medium of instruction.

In a recent article, Dr. Rowland Rogers of Columbia University asked these pertinent questions:

> Can visual aids help reduce pupil mortality?
> Can they better existing methods of imparting information?

STUDIES OF ESKIMO LIFE

Can they stimulate the student's imagination and constructive thinking?

Can they create the desire to learn to know?

These questions are unanswered. Many years of research, investigation and observation will be needed to determine the advantages and limitations of visual aids and the field of their usefulness.

No Established Method of Use

The motion picture medium has no precedents or traditions behind it and the methods found useful for the slide and the stereograph do not apply. The teacher, accustomed to regard the cinema as entertainment, is inclined to sit back and just enjoy the film in the classroom and to allow his pupils to do likewise, particularly when he does not know what else to do. Then, too, schools being poorly equipped for classroom instruction via the film, pupils are often herded into the auditorium to see "a movie show," often the entire school or several classes together under circumstances absolutely precluding the application of any pedagogical method even if one were at hand.

The present-day teacher may well ask: Are we justified in experimenting with our children in so unproven a field?

Such are the objections presented for the reader's consideration. Of course, a judgment can not be based solely upon the negative side of a question. The positive side must also be weighed before a practical decision can be reached.

IV

ADVANTAGES OF USING FILMS FOR INSTRUCTION

In the foregoing chapter effort has been made impartially to present all of the objections to the use of films in education thought worthy of consideration which a considerable amount of painstaking research has revealed. The present chapter will weigh in equal fairness the positive advantages which the use of films holds forth and discuss the more important objections offered.

Pictures are able to standardize impressions and make them clear and complete, uniform, lasting and specific. By them the abstract can be made concrete, the absent present. They can bring into the classroom faithful representations of objects which are too far distant or too small or too large or too rare or expensive or dangerous or otherwise inconvenient or unsuited for direct classroom examination. Pictures of an object can frequently reach simultaneously and equally a greater number of spectators than can the object itself. These capabilities are possessed by the still photograph, the slide, the drawing, the stereograph, in common with the motion picture. The latter possesses some advantages over the still group; conversely, the still group presents some over the cinema.

To a greater extent than any still representation, the cinema is able to present objects as they actually exist,

move and have their being, bring distant peoples into the classroom and show them actually going about their ordinary pursuits as they really did in the distant land when the picture was being taken, or, better still, it in effect transports the spectator to the distant land and enables him to mingle and live with its inhabitants, to view the country from the observation platform of a railroad train as it winds its way through chasms and valleys and mountains, or to stand beneath the waterfall many hundreds of miles away and almost feel the spray upon his brow.

Motion pictures overcome time and space. By means of them rapid processes can be slowed down and analyzed; slow processes can be accelerated; inanimate objects animated; dead facts made to live and pulsate. Attention can be held and concentrated and the memory more deeply impressed by the moving image projected on a brightly illuminated screen in a darkened room than by ordinary teaching methods.

Scientific experiments and demonstrations performed with ideal equipment and under the best possible conditions, and operations performed in the clinic can, by means of motion pictures, be repeated indefinitely anywhere and at small expense. Microscopic life can be enlarged many times on the screen, so that what can ordinarily be seen with difficulty through the microscope by only one at a time can easily be viewed on the screen by an entire class. Motion pictures expand the experiences of the pupils by bringing to them the whole wide world. Schoolroom instruction can by this newer medium be made more pleasant, less expensive in the long run and immeasurably more efficient.

Motion pictures mean bringing life into the school-

room—things as they are. Rushing rivers, the bubbling lava, caldrons of great volcanoes, waving fields of grain, vast forest fires, the mighty ocean and its pounding surf, the storm clouds—all are by means of the moving picture more than by any other means brought into the school. It acquaints the pupil with living, moving specimens of the world's animal life; the deer and bear in the forest, the tiger and elephant in the jungle, the life in sea and river, the unseen life under the microscope. The pupil is made to live his lessons, not just to read about them abstractly, coldly, distantly in his textbook.

When he studies geography, the cinema transports him as if by magic to the scenes of his studies where he lives among the native people. He studies biology, and the films bring the living animal life of the world and its native environment to the classroom. Is it any wonder that school work immediately becomes more pleasant and more effective?

The writer has just witnessed a four-reel exposition of the Einstein theories, which, in less than an hour, left a clearer, more graphic appreciation of the theories of this great scientist than two days' study of text could have given. In fact, the text without the picture could never have made the theories so clearly understandable. And the memory of the animations will last long after the memory of the printed page has disappeared.

Motion pictures can show a projectile slowly traveling from the gun and leisurely pressing its way through the target and can analyze one by one the slow, graceful movements of the racing horse, and, on the other hand, can show the flower bud opening to the full-blown flower or the dragonfly emerging from

its chrysalis in the brief space of a minute. The formation of the mountains and canyons through the slow processes of the ages can by films of animated drawings and models be vividly presented to students so that they will never forget. The electric current passing through a series of wirings of an electric motor, the nervous impulses passing between various parts of the body and to the brain, the circulation of the blood through the body, can be described in books but can be clearly and plainly shown in film. Think of what the child can learn easily, pleasantly, accurately and efficiently by seeing the actual workings of the whole venous and arterial system of man!

An experimental demonstration is performed by a great physicist in his wonderfully equipped laboratory, where every facility and the most modern and efficient apparatus are at hand. A motion picture camera has caught every detail of the demonstration. Thereafter every student of physics in the world may witness the demonstration in the film and at less expense to the school and with more efficient results than though performed in the laboratory.

A great surgeon performs a marvelous operation. A few fortunate medical students are gathered in the amphitheatre. They strain to see every movement of the surgeon's dexterous fingers as he skillfully makes the incision, removes a pernicious growth and sews up the wound. They miss much of his skill and dexterity, but the operation is over and the lesson, which only a privileged few could attend, is finished. Students less fortunate can only read about the great surgeon's work. But no! Two motion picture cameras have been at work from advantageous points and have caught every detail of the operation. Students all

over the world may now witness the unusual operation performed over and over again by the expert. Hundreds of students can see it at the same time, plainly, frequently, and the work of the great surgeon becomes an immortal teacher of thousands.

If we were bringing the case of Motion Pictures in Education into the courtroom for trial before an impartial jury we could undoubtedly secure great masses of evidence on both sides. In collecting data far more was found in favor of the use of films in schools than against their use. All of the testimony against the film which we could find we gave in the preceding chapter. We shall now consider these objections and see what can be said on the other side.

No user of visual aids will deny that there are very definite limitations to the use of films in schools and every prospective user of motion pictures should carefully weigh the limitations and advantages and decide for himself if the advantages to be gained are sufficient to justify their use. It is interesting to note that, where films have been used as a part of classroom instruction, in the majority of cases the reaction is highly favorable. The school superintendent of Emporia, Kansas, says:

> I consider the use of slides and films invaluable in teaching nature study, geography, history and civics. It has also proved a great help in making the school a social center.

The Superintendent of Schools of Auburn, Nebraska, writes:

> I consider equipment for motion pictures as necessary as textbooks. We are adding to our apparatus as fast as funds permit. It is the last word in efficiency in our modern educational system.

§ 1

But the user of films in education should know how certain limitations can be overcome. Let us take the matter of eye strain. We have said that there are three causes for eye strain from films—faulty projection, old or badly scratched film and weak or defective eyes. The school can and should refuse to accept and run films in worn-out condition. There is no good excuse for faulty projection even on the part of amateurs. Operating a projector is not a difficult job and is one which a member of the faculty or a bright pupil can usually perform with entire satisfaction. Machines should be kept in good order and in proper adjustment, and no dirt or dust should be allowed to collect around the film gate. As for weak eyes, the abnormal child should not be allowed to determine the policy for the normal individuals of the class. With proper film, properly adjusted machine and normal eyesight, no appreciable eye strain results.

§ 2

To put films into the schools *does* involve labor, expense and knowledge of the subject.

To install and equip science laboratories requires the services of those who know what is needed and of skilled labor to make the proper installation, and the same is true of motion picture equipment. No well-equipped school of tomorrow will go without motion picture equipment merely because of the mechanical difficulties. There are mechanical difficulties in installing light and heat and water and yet what modern dwelling is without these things? As a matter of fact there are many types of motion picture installation which are exceedingly simple.

This subject will be discussed at length in Chapter XI.

§ 3

The fire danger arising from the use of films seems from actual experience to be greatly over-stated. No serious fire has occurred in a properly equipped film theatre and no serious film fire of any kind has occurred in any school. This may be due in a large measure to honest recognition on the part of authorities that film improperly handled is dangerous but properly handled is not.

There is no more reason for refraining from the use of film merely because when misused it becomes a menace than for depriving a school of electric lights or heat on the ground that their careless and improper use is dangerous. Properly handled it is no more dangerous than the gasoline in an automobile, the highly inflammable lace curtains at the window or the flimsy dress of the child. If any of these are permitted improperly to come in contact with flame danger results. The school motion picture equipment should be installed from the standpoints of both safety and efficiency. The well-appointed school should possess approved projection equipment properly installed in accordance with specifications of local fire underwriters and fire authorities and equipped with all the requisite guards against the possibility of fire. Where a lower price equipment must be used the type conforming to the local fire laws and provided with reliable fire guards should be secured.

The objections raised on the grounds of fire hazard refer only to the highly inflammable nitro-cellulose film, which is the kind now most generally known. There is also a "safety" film coming more and more

into use, and it is not attended with any fire risk. This and the entire question of fire hazard will be fully discussed in the chapter on Mechanics of Installation and Operation, to which the reader is referred for more adequate information on the subject of fire risk.

§ 4

Regarding the prohibitive cost of motion pictures, William Jennings Bryan had this to say in an address before the Visual Instruction Association of New York:

> Many schools complain that films are expensive. They are, but you can afford anything you want if you want it badly enough. The problem of having plenty of good films in the schools is largely a matter of determination on the part of parents and teachers The motion picture is the greatest educational institution that man has known and it won't be long before every school in the country will use motion pictures because there isn't anything good that can not be taught by films.

An editorial in the *Educational Screen* sums up some of the difficulties in the way of the visual education movement very ably as follows:

> (1) Most school authorities not sufficiently convinced of its value to make appropriation for its adoption. (2) Hence, no funds available for the essential equipment. (3) Hence, no chance for teachers to learn to use it effectively. (4) Hence, no market for worthwhile material (slides and films). (5) Hence, no worthwhile producers can afford to supply them in quantity. (Except in the case of slides. Supply of excellent slides is well up to the present demand.) (6) Hence, no final proof of the value of visual instruction is possible. (7) And many school authorities want "final proof" before appropriating! The last named closed the vicious circle.
>
> It makes the solution of the first contingent upon the solu-

tion of the last—a pretty problem since final proof cannot be given until the preceding obstacles have been removed! It is a hard situation, indeed, but not without cure. The cure, in fact, is well started by the progressive schools who have insisted on getting the money whether they had an appropriation or not. It can be done.

Money is the fundamental need, in this as in all other forward movements. The schools did not get their textbooks without it; nor their laboratories and gymnasiums, their pianos and victrolas, without payment of the normal price for such things. It has taken at least a generation for these school appurtenances to pass from the category of "extravagances" to that of "necessary equipment."

Visual equipment must run the same course—but it is running it faster. The screen is already "necessary equipment" to a host of forward-thinking educators. The construction of new school buildings today without adequate facilities for screen projection—as some school boards continue to do in complacent devotion to tradition—is the purest folly. The children and parents of a short decade hence will be inclined to rise up and call such board-members anything but "blessed."

Almost everything worth while is expensive, and usually the more worth while the higher the expense. Well-equipped school buildings are expensive. It costs vast sums properly to train teachers to be efficient. Modern textbooks are expensive but necessary and worth while. All these expenses are economies in the long run because they work for greater efficiency. The same can be said of materials of visual education. During America's preparation for the World War, it was found possible to cut down the training time of many officers several hundred per cent by the use of film in those courses for which good instructional film was available. This was notably true in the motor transport division, for which an extraordinarily good film on the *Elements of the Automobile* (B) was prepared. This film still stands as probably the best existing instructional film for shop work.

The cost of films and equipment is far from prohibitive and will become lower as demand makes quantity production possible.

Any school that really wants motion pictures can have them. The educational film magazines are filled with accounts of "How We Purchased Our Projector." Here are typical examples:

> The University of South Dakota paid for its projector by selling a number of tickets in advance for pictures to be put on after the arrival of the machine. Six tickets were sold for one dollar.

And from Pasadena, California, comes this information:

> The local school board contributed between $200 and $300 for the purchase of motion picture equipment installed in the high school. Their two projection machines, booth, motor generator, stereopticon, screen, wiring and other equipment represent an investment of $2,000 and this would have been a much larger amount had not the manual training students done much of the work under the direction of the teachers. The bulk of the total cost was raised from the five and ten cents' admission fees paid by the students.

It is deplorable that any board of education should be so lax in its obligations to its schools as to make it necessary for pupils or parents to raise money for motion picture equipment or supplies. These should be considered as much a part of school equipment and supplies as maps and textbooks, and provision made for them accordingly. And in very few places, today, even where financial provision is made for films, is this provision adequate. Los Angeles, with a population of a half million, appropriates $25,000 per year for visual instruction in its public schools, while New York City, twelve times as large, appropriates the same

amount, with the result that the vast majority of the seven hundred schools and more in the great metropolis are forced to go without both the stereopticon and the cinema.

Expense should not be permitted to stand in the way of the introduction into the school of so valuable an aid as either the slide or the motion picture. A nation which can spend millions on public buildings and roads and river and harbor improvements and billions for national defense should find means of giving to the schools, public and private, every facility for efficient instruction even including the cinema.

Superintendent E. E. Lewis of the schools of Rockford, Ill., says emphatically:

> Motion pictures are the swiftest educators known. Classroom films meet an economic need. It would be absurd for any board of education to take the position that it can not afford visual education. In education as well as anything else, money can always be found where there is a genuine need to be met. A real teaching film brings out clearly the relation between cause and effect. Such school films used to supplement the textbook teach pupils to think. They enable students to learn more in less time and to remember it because it has been stamped on their minds through powerful visual images, behind which is a sound pedagogic method. We want such films in the schoolroom because they meet a real economic need.

§ 5

If films were proposed as the sole or main material of instruction, the objection that they make learning too easy would have more weight than it has regarding films viewed merely as an aid. It is not proposed that motion pictures replace any active effort on the part of the pupil in the acquisition of learning but that they serve as a supplement to that effort, insuring the accuracy of visual conception, emphasizing what has

already been acquired by direct study, putting the information in more graphic or more readily understandable form and adding interest and inspiration.

It is true that the film puts the pupil, while viewing a picture, in a state of passive acceptance of knowledge rather than prompting him to active effort to learn, but this is fortunately so. If possible the pupil should be kept passive and receptive during the showing of the films, lest, if too actively watching for certain items, he lose many others which a passive attitude would give him a better chance of observing. He should be taught to be observant but not watch for particular, concrete facts, to the exclusion of others, except where this is especially desired. Thus the total of active effort in acquiring knowledge is not lessened but the desire to learn is frequently increased.

And if motion pictures *do* make learning a little quicker and easier for the busy pupil of today, what is the objection? Our present-day curricula are filled to overflowing and our children are cruelly and sorely rushed to acquire the great mass of facts that are crammed into their bulging craniums. If the road to learning is made a little easier and more pleasant via the cinema there will be enough of active effort and drudgery left to insure the necessary mental training.

The opposition from some quarters to the use of motion pictures in education is the opposition that anything new is sure to meet. Because moving pictures are new they are entertaining. They are entertaining because of what they can do, and because of what they can do they have an instructional value as yet unrealized. The mere fact that they have been used largely in this country for entertainment alone seems to have damned them forever in the eyes of some educators.

But isn't the fact that they *are* entertaining an argument in their favor? Froebel based his theory of education on the fundamental principle of *interest,* and there are few children in school today who are not interested in "the movies." "Pictures universally interest children," writes a professor of education, who continues, "and motion attracts attention instinctively. Is this not an irresistible combination?"

While children may object to educational films at the motion picture theatres, the same film shown in the classroom after adequate preparation is hailed with delight. J. H. Wilson, when Supervisor of Visual Education, Detroit Public Schools, is responsible for the statement that "a comedy used in the Detroit Schools as a filler was rejected by the pupils, who said they wanted something better—an educational picture!"

No important essential fact should be taught by the film only. If, however, any fact can be learned better or more quickly or even more pleasantly through its aid, then has the film received full justification.

Dr. Charles W. Eliot, President Emeritus of Harvard University, who has gone on record as being whole-heartedly in favor of the use of films in schools and colleges, says, "Motion pictures are the only simple means we have of making clear the processes of life and industry." And Sir Gilbert Parker writes:

> For myself I always believed that it would be to the advantage of every government to establish films in the day schools. Some say the pupils would learn too easily. I am a fairly well educated man, and from the films I have learned much that I could not learn through books—in zoology and geography, and other sciences, in the scenery and life of places which I had never visited.

§ 6

That films make superficial thinkers is not borne out by testimony from practical school men. The principal of a Philadelphia school writes:

> Films tell their own story and supplement the instruction in the classroom to a degree that is almost impossible by any other method. Invariably the testimony of teachers is that knowledge gained from pictures outlasts all other forms possible in schools. The motion picture outfit is now regarded as one of the most valuable pieces of educational equipment in our school building. Forty-two subjects were covered the first term of school 1921-1922. The motion picture equipment is also used for parent-teachers' meetings, community gatherings, Americanization work and evening school.

And an eighth-grade teacher, when asked if her experience had been that films made superficial thinkers and dulled the imagination, said:

> My boys told me that movies in the schools taught them to be more observing and to utilize the information gained. I have found that they develop the powers of observation in my pupils.

And a fifth-grade teacher, speaking from experience with films, said:

> Motion pictures stimulate interest in a subject, and induce pupils to do more research work.

§§ 7, 8, and 9

Films do not develop superficial thinking if they are properly used.

To the objections that films destroy the sense of perfection in language, reduce reading and dull the imagination, the answer can be given that these objections might obtain if films were to be the sole or main method of instruction, but that when they are used only as supplements to the other already existing methods

of teaching they should and can be made to have directly the opposite effect.

If the student reads a play of Shakespeare, studies and analyzes it, absorbs its beauty of expression, forms his own conception of its characters and situations and then sees a film of the play, certainly his reading has not been reduced, his imagination dulled, his appreciation of its beauty of expression lessened, or his thinking processes made more superficial. Naturally, if the pupil be permitted to replace his reading of the classics with seeing a film portrayal, a harmful result could properly be looked for.

Dr. Lindsay T. Damon, Professor of English at Brown University, writes:

> Films must not be used in schools for amusement only or as a supplanter of the finer things in literature but as a series of glorified illustrations of action, of entire brief narratives or of crucial parts in long narratives. The motion picture in the English class can not be a substitute for work or for books or for reading. It can be used to catch attention, to give significant facts, to drive imagination towards big and fine and true things.

It is a much mooted question as to whether motion picture representations of literature interfere with the play of the pupil's own conceptions, whether if the student sees a character portrayed in a film his own conception does not become identified with and limited by that presented in the film. The same question might be properly raised with regard to seeing a character or story presented in the spoken drama or even regarding illustrations in the text. The latter is, methinks, more open to objection than either the film or the spoken drama because the text illustration is seen as the text is read and the first concepts are formed. The weight of opinion of teachers of literature seems to

favor both the play and the film. Few teachers of English would object to their pupils seeing Shakespeare's plays presented on the stage. Neither could they more consistently object to their attending a dramatization either on stage or in film of a novel of Scott, a story of Poe, or a poem of Whittier. Even a poor film portrayal has been found to serve as the basis of a splendid training in analysis and criticism for the well-prepared student.

Writing of historical films, U. S. Commissioner of Education Tigert says:

> Some have objected that this (the historical film) will destroy the imagination of the children in school. Well, I think we have had too much imagination in history already. Certainly we can find other fields in which to permit the play of the imagination and every thinking person will welcome the presentation of accurate knowledge in history through motion pictures and the substitution of reality for guesswork.

That films reduce reading is not substantiated by the facts, but rather the contrary seems to be true.

Members of the Pennsylvania and New York Library Association declared at their annual meeting that motion pictures were making readers of many who cared nothing for books.

A New Jersey librarian reports as an example of how films increase the demand for the classics from school children, that a copy of *Jane Eyre* was on the shelves for an entire year without a single call, until the film was announced for showing at one of the local theatres, and that after the showing there was a steady demand for the book on the part of school children for the next six months. And in almost every instance, particularly in smaller towns and cities and rural communities, librarians report an increased de-

mand from children and young people for the printed books pictured. *Peter Ibbetson* (FP) was a striking example of a book rarely called for until its film portrayal, and many librarians report a heavy demand for *Oliver Twist* (FN), *Three Muskcteers* (UA), *Count of Monte Cristo* (F), *Les Miserables* (F), *Tale of Two Cities* (F), *Our Mutual Friend* (FBO), and other lesser known classics after their film showing at the local movie theatre. One couple of the writer's acquaintance, returning from a film showing of the *Queen of Sheba* (F), sat up till the wee small hours poring over the Bible to ascertain how near to the biblical facts was the film version they had just witnessed. So it can truthfully be said that the films have sent some people back to the study of the Bible.

§ 10

Where the introduction of films into a lesson caused distraction and the darkness caused disorder proved the exception the rule has rather been that so great is the interest of the pupils in the pictures that unusual attention and order is maintained during the exhibitions. If the teacher has proper control over his class, prepares his material beforehand not only with regard to his knowledge of the contents but also as to the physical handling of the material and takes suitable measures to effect a smooth and quick transition from the spoken lesson to the picture and to hold the pupils' attention during the transition, there will be no distraction or disorder. The writer's own observation in showing films to large numbers of children, even strange children over whom he had no direct authority, is that almost without exception they were held in

(National Non-Theatrical Motion Pictures, Inc.)

A LESSON IN PHYSICAL GEOGRAPHY

such intense interest by the films that they were unusually quiet and attentive.

It might well be mentioned here, in passing, that daylight screens have now developed to a point where it is possible to project pictures on them in the diffused daylight of the classroom with thoroughly satisfactory results. Their use will obviate the need of dark auditoriums and, more important, the delays and confusion incident to darkening the room during class. However, this is not now practicable in most classrooms, since it requires projection from the rear of the screen. It is mentioned here only as a future possibility for most schools.

§ 11

We can not over-emphasize the fact that motion pictures should be considered as merely one more aid to education, a supplement to the text and the teacher and not a supplanter of them.

That films replace the effort of the teacher may be true in individual cases but it has been found in practice that the value of a film lesson depends very largely on the individuality of the teacher and the manner of its presentation. It is generally the careless or indifferent teacher who allows the film to replace his own efforts, and in justice to our teachers let it be said that there are comparatively few of these. There are, on the other hand, teachers who lack initiative or who have not yet learned how to make the film lesson an integral part of school work. This will be overcome to a large extent when methods of use are studied and taught.

A. G. Balcom, Assistant Superintendent of the Newark, N. J., schools, writes:

Visual aids are a means to an end, they require the human

touch, they are given the breath of life by the skillful teacher . . . The use of film for instruction purposes requires the highest kind of teaching. We have noted that a film pronounced excellent and full of interest to one teacher has been disappointing to another teacher of the same grade. The instructional qualities of a film evidently depend quite as much upon the vision of the teacher using it as upon the film itself.

And this from the U. S. Commissioner of Fducation:

Some have been fearful that those who advocate visual aids in education are under the delusion of thinking that a substitute may be found for the teacher in the school. I would be the last man in America to contend such a thing. The teacher with personality who is adequately trained, intelligent and happy in teaching is incomparably the most important element in any school and will continue to the end of time. This does not mean, however, that even the greatest teacher can not be aided by those new agencies which scientific discovery makes available from time to time. Those who oppose now the introduction of slides, stereoscopes, and films into the school because they interfere with the teacher would have opposed the introduction of the blackboard because it tended to supersede the teacher in some respects. The blackboard is as much of a visual aid as the film, the slide, or other forms of pictorial presentation.

Films when properly used require an added effort on the part of the teacher, but where such an effort has been made the teacher has been the first to proclaim that the result was worth the effort. The suggestion as to how this effort can best be directed must be left for consideration in a later chapter to be devoted to teaching methods.

Far too many claims have been made for the educational film on the one hand, while, on the other, critics have frequently jumped to the conclusion that when one advocates the use of films in schools he wishes to abolish the teacher and the text. No teacher

no supervisor of visual instruction, no principal or superintendent of schools has gone on record as favoring the use of motion pictures to the exclusion of teacher, text or any other visual aid, be it chart, map, exhibit or slide.

But we do maintain, and practically every school man or woman who has used films in the classroom will agree with us, that the motion picture "with its alluring, shifting scene, its compelling reality, its limitless range of subject, representing the most highly evolved educational instrument that the present century has bequeathed," has a very definite place in education.

V

ADVANTAGES OF USING FILMS FOR INSTRUCTION (*Continued*)

§ 12

ARGUMENTS presented by advocates of the slide and the photograph were presented in a preceding chapter. Here we shall discuss the other side of the question, though first emphasizing the fact that there are many subjects which *can* be taught as well and better by means of "stills" than by motion pictures. There is no question but that the slide, the still picture, the map, the still diagram and the stereograph have their very definite places which can not advantageously be usurped by the film. The writers have long been devoted to the use of these still forms of visual instruction and hold their value exceedingly high. If an object be not essentially a moving object there is no valid reason for showing it in a film in preference to a slide or other still form. It is a mistake, for example, to illustrate architecture by moving pictures. If the architecture of the Capitol at Washington is to be shown, a still or a slide should be used, but if the purpose for which the Capitol is to be shown involves certain phases of the activities to be seen around the Capitol, as, for example, the ceremonies surrounding the inauguration of a President in front of the Capitol, a motion picture would teach the lesson better. A slide showing a distant view of Mt. Shasta

might be better than a motion picture of the same still object, but a motion picture of mighty Niagara with all of its action and life would be preferable to the still. In this connection let us refer to the quotation previously made that "Of still objects like the Capitol at Washington, a banana tree, the Panama Canal, etc., a more comprehensive view may be obtained from still than from moving pictures." The broad assumption is made that all of these are still objects. This is wrong. The banana tree growing and yielding its harvest to the native fruit gatherers, the Panama Canal with its locks opening and closing, the water within them lowering and raising and sending thousands of ships on their way, are very far from still objects. The visual educator should distinguish in recommending the still picture in preference to the cinematographic, whether he has in mind teaching merely the form of the tree and the construction of the canal or their life and growth and use.

The still picture, slide, diagram, chart, map and film should be used side by side, supplementing one another. We are devoting this book to the motion picture, not because we desire in any way to have films preferred over the other forms of visual aids but because we feel that the use of the film deserves a separate treatise and because, being a newer medium, sufficient instruction and preparation for its use have not yet been given.

§ 13

Five years ago it could truthfully be said that the dearth of truly educative films was the most formidable objection to their use. Today there are many excellent films of instructional value available. Let us pause a

moment to read what practical school men who have given visual education a trial have to say.

William Rabenort, Principal of Public School 55, Borough of the Bronx, New York City, where films are regularly used as part of the classroom work in geography, biology and nature study, told the writer that he had found more good films on these subjects at his disposal than he could possibly use during any school year and that since introducing films into the school system as a part of the classroom work he had had no difficulty in securing plenty of good films suitable for his purpose. His difficulty was rather to find the time for all the worthwhile films he would like to use!

Charles Roach, in charge of the Visual Instruction Service, Iowa State Agricultural College, writes as follows:

> It is now possible to build up complete geography courses and visit every continent, country and important city and trade center on the globe by means of films. Teachers of geography have every possible opportunity to use present and existing films with practically no change. Science subjects are next in importance in regard to quantity of films now available. Zoology, botany, chemistry, physics, agriculture, home economics, insect and plant life, crystallography and animal studies are available in news reels and screen magazines. Industrial films are easily adapted to special classes.
>
> History, language and literature may not be so easily presented by films, but the present supply includes features with plots based on legends, historical facts or works of literature suited to every class in the school system. With all of this available material any school may now give Visual Instruction a trial.

And another practical educator says:

> Hundreds of worthwhile programs for the High School, elementary schools, public or private graded schools and even

the college and university can be made up from the present stock of prints in the various exchanges. Motion pictures in schools can be divided into two main divisions,—classroom films, which should be pedagogical, planned to draw out, not to pour in, and general culture films. There are many general culture films available.

It is undoubtedly true, and is becoming more true day by day, that instructional films are now obtainable in considerable numbers. To be convinced of this, one has only to study the list of "1001 Films Plus," distributed by the *Educational Screen;* the lists issued by the National Board of Review, which include 354 films on North American geography, 367 on world geography, 233 on zoology, biology and botany, making a total of nearly 1,000, besides a long list of industrial films; the catalogues issued by the Bureau of Commercial Economics at Washington and by the Industrial Department of the International Committee of Y. M. C. A.'s, New York City, each containing three hundred or more industrial subjects; the catalogue of films issued by the Department of Agriculture at Washington, in which several hundred subjects are listed, and the catalogues and lists issued by the several non-theatrical producing and distributing companies. From even a hasty perusal of these lists and catalogues it is readily seen that there is a wide variety of instructional films from which to select. It is true that they vary greatly in excellence. Some are far from ideal but nevertheless usable and useful. Others are decidedly good and will set the standard for many years to come.

One reason why there are not more truly educative films on the market is because the demand from teachers has not been great enough and prices they are willing to pay have not been high enough to justify a larger output on the part of producers. Hon. J. M. McCon-

nell, State Commissioner of Education of Minnesota, went to the heart of the problem when he said:

> The public has learned to be entertained by the motion picture. It has not yet shown a disposition to pay corresponding amounts to be instructed by it. Hence amusement possibilities have been developed inordinately while the educational phase has made little progress. There is a large and relatively unoccupied place in the educational field for the motion picture. The educational film should be accurate as to fact and will be compelled to tell its story solely for instruction and be so accepted. The educational film when it comes into general use, must come at high initial cost and will stand on textbook level.

§ 14

The charge that films are too frequently inaccurate and untrue to life refers rather to theatrical than to educational films, and though it does have application to many films purporting to be historical or literary, there are a sufficient number of well-made historical and literary films to justify disregarding the other types.

§ 15

When teachers object that motion pictures move too rapidly for the child, they are, in reality, confusing rapidity of motion with brevity of scene, which is quite another and much more easily remedied fault. Motion pictures do not move too rapidly for the reason that they move at exactly the same rate of speed as the original action which they picturize. This statement is made on the assumption that the film is projected at the normal rate and is neither an analysis-of-motion nor an accelerated-motion study. The camera normally takes pictures at the rate of sixteen exposures per second. They should be projected at the same rate. If this is done, the speed of the action as shown is precisely the same as of the action photographed. The

fault which the critic senses is that many films contain scenes which do not stay on the screen long enough—not enough of the action is shown. Sometimes this can not be avoided, as in the flight of a bird. But often it can be remedied by letting the action continue for a longer time or by repeating the action two or more times. Moreover, the film itself can be run a second and even a third time. The film of abbreviated scenes shown in rapid succession is typical of the short-length theatre production. Educational film-producers are devoting more length to both scenes and titles, to give the child of slower observation a better chance. Of course a film should be run at normal rate and not speeded, particularly if it be an educational film. Dr. Rowland Rogers of Columbia, referring to the speed of the film in the sense that it represents sixteen separate mental impressions every second, or 16,000 in fifteen minutes, says that this speed stimulates the mind to observe and react quickly.

§§ 16 and 17

The objections most frequently advanced by educators against the use of films are that their benefits are uncertain and unproven and that there is no established method of use. A definite method of use will be set forth in another chapter. Here shall be presented some of the evidence of the benefits to be derived from the use of films, in the form of experiments and tests. The mass of such evidence, though small, is fast accumulating.

Although few, if any, exhaustive tests have been made to determine the teaching value of films and although the tests which have been made can not be considered conclusive, such as have been conducted are presented as contributing factors if not definite proof.

It must be remembered that tests conducted under experimental conditions with results tabulated in statistical form which prove everything to a detached investigator may be found valueless to the actual worker in the field. Experiments, having all the outward appearance of being scientifically and accurately staged, can be and have been conducted which give equally convincing evidence on both sides of a proposition. We make these statements out of an impartial desire to be fair, in face of the fact that the bulk of the tests give evidence which is overwhelmingly in favor of our own views. These tests are not, to our mind, as conclusive as deductions made from experience, observation and reason.

The New York Public Schools began the use of films in 1920 as supplements to courses in biology, United States geography and physical geography. So worthwhile did films prove that the following year their number and the number of schools using them were considerably increased. Similar reports come from the schools of Newark, Detroit, Chicago and the forty or more other cities in the country where films are systematically used to a greater or lesser extent in classroom instruction.

That films save time is claimed by several practical school men and is backed up by the Director of Visual Education, Detroit Public Schools, who made the following interesting time experiments:

The test was made to determine the length of time required to teach the same subject visually and orally. The children were divided into two corresponding groups according to intelligence ratings. The subject of the lesson was "How We Hear," this film being selected because of the value of the subject and because

it was new. The film, a short one, was shown twice, the two showings requiring only thirteen minutes. In this instance the class was given *no* preparation, explanation or assistance in the interpretation of the film, because of the nature of the experiment. The oral lesson on the same subject took 55 minutes. The teacher very carefully prepared and as carefully presented her subject. Both groups were asked the same questions. The average grade of the visual group was 64.76 and of the oral group 61.5. The conclusions drawn from the experiment were that the visual lesson accomplished *better* results in less than *one fourth* the time required to teach the same subject orally. Four weeks later a second or memory test was given, with the same result; the averages the second time were 63.9 for the visual group and 59.5 for the oral group.

In another test conducted in the Detroit schools the film story of oranges presented in 17⅔ minutes, covering agricultural, horticultural and marketing problems in detail, when compared with the best 30-minute oral presentation that could be secured, showed, for a group of twenty-four mentally equal children, an oral average of 70.8 as compared with a visual average of 78.

The fact that the visual lesson accomplished better results in much less time and *without previous preparation* is significant.

A test to determine the relative value of film and text was made under the direction of Eugene E. Nifenecker, Director of the Bureau of References, New York City, in seven New York public schools. The subject was the Geography of South America, and the pupils were all sixth-grade students. Motion pictures were used in the control groups. The result showed

33.9 credits for the class taught visually as against 23.3 for the control groups taught by text alone,—another score for the film!

"The most important advantages of the visual method are that they save time and increase exactness," writes C. E. Turner of the Massachusetts Institute of Technology, in his article, "The Evaluation of Visual Education," in the course of which he says:

> By a fifteen minute film showing and describing methods of waste disposal in cities results of an all day field trip were secured. Such a field trip for the class of 150 men represents an expenditure of five months in time for a single individual.

Prof. J. W. Shepherd of the University of Oklahoma conducted a series of tests at the Madison, Wisconsin, High School to determine the teaching efficiency of a motion picture film as measured by results obtained by the teacher in the classroom. Abstract and concrete subjects were taught (1) by film only; (2) by a superior teacher; (3) by an average teacher.

Films alone scored an average of	75.5
The superior teacher scored	66.9
The average teacher scored	61.36

The significant feature of this test is that the film alone beat the best teacher 6.6% and the average teacher 12.14%. It is not strange then that some there are who predict that the time may come when the film will replace the teacher and the textbook, but experience has proven that the best results of all are obtained by a combination of the three,—accurate text, efficient teacher and a truly educative film.

J. H. Weber, in his book, *Comparative Effectiveness of Some Visual Aids in Seventh Grade Instruction,* reports a series of interesting experiments. One of the

most significant was conducted to determine the effectiveness of four different methods of presentation—(1) the study of the printed lesson; (2) the same lesson presented orally by the teacher; (3) the lesson depicted by a film, and (4) the film presentation accompanied by explanatory comments. A summary of the results gave evidence that "Teacher" scored lowest; "Study" came next; "Film Alone" scored a little higher, and "Film-Lecture" made the highest score of all.

Four films were chosen for the experiment. They were *The Study of a Mountain Glacier, The Earth and the World Beyond, The Southern States* and *The Growth of Cities and Their Problems.* The subject-matter in each of these was made into a two-page typewritten lesson. The subtitles were made paragraph headings. The lessons were made of such a length that they could be perused slowly and carefully in ten minutes by normal seventh-grade pupils. Before each of the four methods of presentation the pupils were warned that they would have only ten minutes to get the lesson and that a test would follow.

A summary of the averaged averages made by all 7B-grade pupils after each of the four different methods of presentation reads as follows: Study 48.80; Teacher 48.50; Film 50.48; Film-Lecture 52.17.

Conclusions reached by the experimenter are summed up as follows:

> The averages of the Film-Lecture presentation are almost invariably higher than any of the other three methods. It may be safe now to assert that the value of the picture as an aid in teaching stands proved.

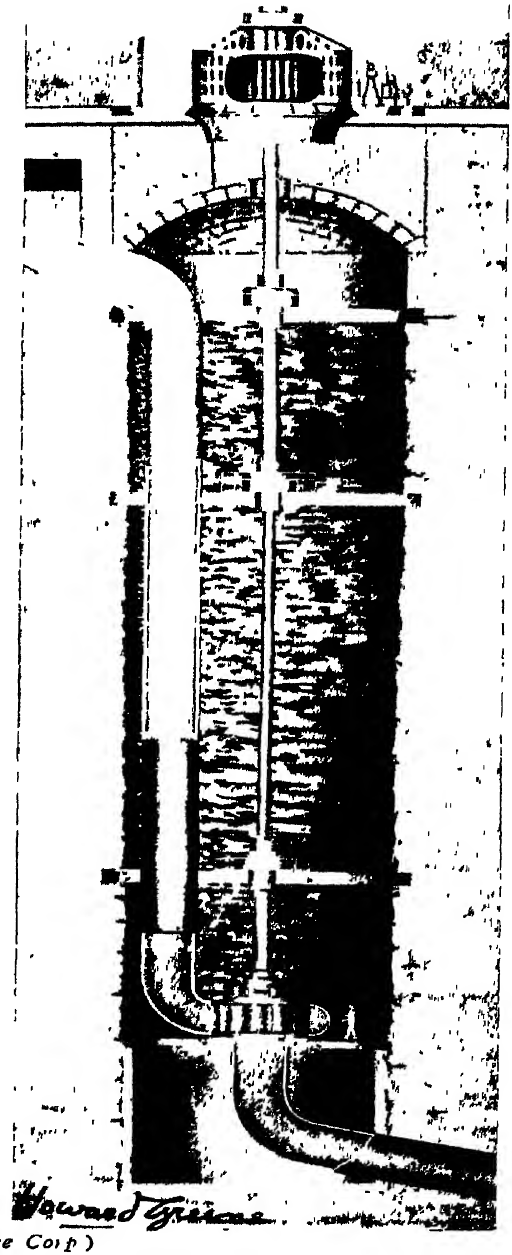
Although the film alone was below the verbal presentations the really significant difference was between the

two film presentations, indicating the value of intelligent direction of the pupil's attention by the teacher, and since in a verbal test the pictorial impressions must be translated into verbal imagery by the pupils examined, it is remarkable to find that the "film alone" was almost as effective as either "study" or "teacher."

A "concealed" test, conducted by Mr. Weber, indicated that "a pictorial presentation, compared with a verbal presentation, has a manifestly greater influence upon choice by at least two per cent," which, Mr. Weber points out, may throw some light on a great question, "Do our films influence perceptibly the conduct of the youth of the land?"

Roy L. Davis, graduate student of New York University, in a series of experiments conducted to measure the effectiveness of visual aids, seems to have reached these conclusions: (1) Motion pictures should be differentiated for pupils of different ages; (2) Pupils know more about lessons, particularly visual lessons, with a few exceptions, a week afterwards than they do at the time.

An experiment being conducted under the supervision of Dr. Frank N. Freeman, Department of Education, University of Chicago, and F. Dean McClusky, instructor in educational psychology, University of Illinois, is attracting considerable attention and comment. The sum of $10,000 has been granted by the directors of the Commonwealth Fund to the University of Chicago for "The prosecution of research in visual education." The work, according to the announcements issued, "will consist of experiments conducted in public schools to compare the efficiency of visual methods and especially to study the effectiveness of motion pictures in comparison with other methods. The particular aim



(Harry Levey Service Corp.)

WORKING MODEL OF A TURBINE

of this study is to discover the types of lessons or the problems of instruction which are adapted to this new method of teaching. It is desired to determine whether or not the production of educational films is proceeding in the most economical and advantageous direction."

The second part of the study deals with the method by which the motion picture film may be better adapted to the purpose of teaching. This phase of the research, we are told, will consist of a more analytical laboratory study of the various factors comprised in the motion picture film, in order to investigate their effectiveness in detail.

We sincerely hope that the results will be of practical benefit to those using and desiring to use motion pictures in education. However, enough proof has already been assembled to justify any principal, who has the funds at his disposal, in introducing motion pictures into the school curriculum, and enough is already known as to the methods of use so that no one need refrain from the use of this important medium while awaiting the outcome of these experiments.

What is the value of all such tests? Do they throw any light on the subject,—Shall we use films in education?

From the Weber test it appears that the film-lecture method scores highest, the film alone second and the teacher alone the least effective of all. The Shepherd tests indicate that film alone scores higher than the superior teacher and 12% higher than the average teacher.

On the other hand a test to "determine the pedagogical and moral value of the motion picture," reported by John V. Lacy in the *Teachers College Record,* claimed that "oral presentation" and "silent

perusal" scored higher than the motion picture presentation.

Our answer is that while the majority of tests are favorable to visual education and may prove helpful and should therefore be encouraged they are not conclusive unless supported by reason and sound pedagogical principles. And all the experiments that have been and are still to be conducted, be they favorable or unfavorable, can not alter the fact if logic and sound pedagogy proclaim that educational films are a valuable aid to education.

Conclusions

The objections raised to the use of films for pedagogical purposes are such as will always be raised to new and progressive methods, and it is well that these objections be raised. They constitute the acid test which should be applied to any innovations before they are adopted,—the balance wheel which steadies the machinery of the school, prevents new ideas from disrupting the mechanism and makes them prove their worth before acceptance.

Many extravagant claims have been made for the use of films in education. They have been hailed as the panacea for all educational ills and shortcomings. No less a genius than Thomas A. Edison, for example, states as his belief that motion pictures will supplant textbooks. "The only textbooks needed," he is quoted as saying, "will be for the teacher's own use. Films will serve as guide-posts to these teacher-instruction-books, not the books as guides to the films. Pupils will learn from films everything there is in every grade from the lowest to the highest. . . . Films are inevitable as practically the sole teaching method."

To offset the logical inference of such misleading prophecies, certain definite limitations should be set down as to what the film should and should not be expected to accomplish in the field of pedagogy.

The film's primary purpose is to teach, to clarify, to arouse interest, to stimulate to greater endeavor on the part of the pupil. It is valuable for furnishing a background, to give atmosphere and to furnish experiences which the child is unable to gain at first hand. The film will enable the eye-minded children to keep pace with the ear-minded children. The film lesson has proved of great benefit to the backward pupil, to the pupil with few first-hand experiences, to the slower intellect, and to all of those who learn more readily and more accurately by seeing than by hearing.

The film should *not* be used as a substitute for any of the tried and true factors, methods, or materials that have proved their worth in the school, or for the teacher, the textbook, the map, the photograph, the slide, or the stereograph, or for study, reading, laboratory work, or for such actual objects as botanical specimens which can be brought directly into the schoolroom for examination.

The cinema should be regarded simply and solely as one of the many visual aids to instruction, a supplement to other well-established methods. Further, it should be used only where motion is essential. Many so-called educational films are made up of text interspersed with still illustrations,—absolute abominations which in no way equal in effectiveness a combination of textbook and still illustration in the form of photograph, stereograph or stereopticon slide. And there is no excuse whatsoever for attempting to show in film such still objects as a building, viewed from the stand-

point of architecture, a sea shell, a stuffed bird, a statue, or a painting. These objects can be shown a thousand times better and much more cheaply in still pictures.

Films should not be substituted for study, reading or field or laboratory work. Study trains the mind and gives a grasp of a subject that no amount of merely looking at a picture can possibly bestow. In reading, a person is able to analyze the thought of the author and give active attention to the ideas covered, while witnessing a picture is mere passive acceptance of the thought images which come too rapidly to permit of much analysis. Films should not be expected or allowed to take the place of the student's own investigation in field or laboratory. However, films of laboratory demonstrations performed under ideal conditions with exceptional equipment and rare or expensive subjects, or involving hazard or great expense, can often advantageously supplant such original demonstrations, especially in schools with limited facilities. But why use such a film as a botanical picture we have seen, showing a simple field flower, its various parts pointed out cinema-wise, when it would be easier, cheaper, more sensible and infinitely more efficient to bring the original flower or fifty of them into the classroom for direct individual study?

Films should not be used without proper preparation on the part of the teacher and pupil and without having the mechanics right. Even the right type of film, improperly shown, because of the teacher's lack of familiarity with the film, or of failure to prepare the pupils for its presentation, or of poor or incorrectly adjusted or handled equipment, will stamp the project a failure.

The screen, the type of machine, the lens, the lamp

should all be correctly chosen and properly installed, and a teaching method which is pedagogically sound should be applied to the use of films.

In this chapter it must suffice to establish broadly the fact that the demands of both mental and mechanical preparation establish definite limitations to the successful use of the cinema.

It must not be thought from this discussion that the use of motion pictures involves any great or serious difficulties even in the school only moderately well equipped. These warnings are given rather for the purpose of establishing moderation and of confining the efforts of the ultra-enthusiastic exponents of visual instruction to normal bounds than in any way to discourage the novice. To adapt motion pictures is comparatively simple and thoroughly practicable for the vast majority of schools.

It is gratifying to find that the judgment of our own leaders in education is confirmed by the well-considered opinions and recommendations of some of the foremost educators of France, the country to which the world owes so much of the early impetus given to the instructional film. An Official Commission of the Republic of France, appointed to determine whether films should be used in education and the best means of adapting them to that use, has made a most illuminating report. The Commission made extensive study of the subject, held many conferences, heard arguments for and against the use of films in education, visited classrooms where films were used and conferred with the film-producing companies. In making its investigations the Commission appointed three sub-committees, one on programs, one on technique or choice of apparatus and films, and one on means of realization, and tried to

answer these three questions: (1) In what measure shall films be used and how? (2) What qualities should films and machines possess that are to be used in schools? (3) What are the most practical means of securing films and machines for use in education?

The Program sub-committee recommended that films should not replace the teacher but be used as an aid; films should be correlated with the lesson; films are especially adapted for teaching anatomy, physiology, zoology, geology, botany, chemistry, physics, geography, history, and industrial processes; stills should be used with films; suitable explanations should accompany every film used in teaching; teachers must be instructed how to use films, and the statement was made that certain good films are now obtainable.

Having decided that films should be used, that they are obtainable, and that suitable projection machines are on the market, the Commission further recommended that the state make necessary appropriations for the use of them in all branches from elementary schools to colleges, the expense to be divided between the national government, the commune, and in certain instances the college or school. Film libraries should be established, where possible using normal schools as distributing centers. The Minister of Public Instruction might well apply the same rule to films as to books,—to establish a collection passed on by himself.

Conclusions and recommendations of the Commission were summed up as follows:

(1) Films should be used in all branches of education.

(2) Films should not replace teacher or textbook but should be used as auxiliaries

(3) The film should prove especially valuable in the demonstration of experiments.

(4) It is desirable in instruction to combine pictures taken

at normal speed with slow motion and analysis of motion pictures.

(5) In principle, the pedagogical film is yet to be produced. To produce such films the collaboration of competent educators is needed. While waiting for these especially prepared films a large number of films already used by teachers with excellent results can be utilized.

(6) Special conferences should be organized in all normal schools for the purpose of instructing teachers how to use the cinema in teaching.

(7) A Commission should be established to examine and list all films which could be used in the different branches of teaching, this list to be published in all official bulletins of the Department of Public Instruction.

(8) The Commission should begin the examination of all projection apparatus which can be used in public schools.

(9) As there is no non-inflammable film available the apparatus should be equipped with every possible safeguard. (This condition has happily been remedied.)

(10) As large an appropriation as possible should be asked of the Government for the placing of projection machines in all schools as soon as possible. This should be pursued until all the schools of France are furnished with this marvelous means of instruction.

The wisdom of these recommendations has been borne out by practical experience and in most cases they basically parallel the recommendations made in this book.

While English conservatism has not progressed as far towards the use of the cinema for instruction as either France or the United States, that keen observer of world tendencies who has come out of Britain, H. G. Wells, has this to say of the potentialities of educational motion pictures:

> All the demonstrations and experiments that science teachers will need in the future can be performed once for all before a camera. They can be done finally. They need never be done again. Anything that is very minute you can magnify; anything intricate you can record with extreme slowness; you can show facts six inches or six thousand miles away.

And Wells does not stop here but goes further, saying:

> All that your teacher need do now is to spend five minutes getting out the film he wants, ten minutes reading over the corresponding lecture notes, then he can run the film, give the lesson, question the class, note what they miss and how they take it and run the film again and get out for subsequent study diagrams and pictures needed to fix the lesson.

This is one of the statements that probably called forth these pertinent remarks by A. P. Hollis, in charge of Visual Instruction, North Dakota Agricultural College, who in the course of a discussion of "The Teaching Value of Films," writes:

> Somewhere between the familiar over-statements of Edison and Wells, somewhere at a respectable distance behind the mere promoter and advertiser type of visual-instructionist, but still a long way ahead of the stupid or lazy educator who refuses to grant new ideas a trial—the teaching film will come into its own. And we may be sure and content that it comes as an aid to the teaching process,—not as a substitute

"The four M's—Movies, Muscles, Mind and Morals—have taken the place of the three R's," aptly says Dr. Wm. L. Bodine, Superintendent of Education, of Chicago.

> In future [he says] the cinema will be the ace of education. Movies are here to stay. They are educators as well as entertainers Progressive education calls for picturized pedagogy. The expansion of visual education is predestined for the American schools of the future Future school histories will be on silver sheets Travel films will be the progressive geography of the future. The film school will reduce truancy. Less truancy now means less expense to the taxpayers in the maintenance of corrective institutions and prisons. . . One important factor in the truancy problem is the group of pupils who are usually classed as backward. Motion picture lessons have a good deal better chance than textbooks and oral explanations to penetrate the dull understanding of

such pupils and reach their interest. In addition visualized lessons will lend the spice of novelty to school work which these repeaters have reviewed over and over again. They will get a new slant on old lessons, and so be pricked into real enthusiasms and interest.

The teachers of teachers in the great training schools, men and women skilled in teaching science, who are devoting exhaustive study to the best methods of instruction, are found among the most ardent advocates of pedagogical films; Judd, McClusky, and Freeman of Chicago, Thayer, Fretwell and Hunt of Columbia, Claxton of Alabama, all add the weight of their authority to this medium. One of the most constructive and succinct statements on the subject comes from the pen of Otis W. Caldwell, Teachers College, Columbia University, who writes:

> There exist fundamental reasons for the use of motion pictures. It is a matter of common experience that we learn more rapidly and retain longer when our learning is based upon first-hand contacts with materials and processes. There is no better way of putting these situations before the learner than by motion pictures. But careful thought development relating to the thing observed is essential.
>
> The relation of visual instruction to reading is also fundamental. We are interested in reading and read more intelligently concerning the things about which we already have some information. Motion pictures concerning travel, industry, manufacture, social and civic situations, furnish the stimulus for reading about these matters and the concrete basis for the interpretation and understanding of reading as well as increase the intellectual aspects of reading.

No less an authority than Philander P. Claxton, former U. S. Commissioner of Education, evaluating the films in education, says:

> The re-presentation of action, movements and processes is the particular field of the motion picture, which thus supplements in a magnificent way all other methods of presentation and representation.

And Dr. John J. Tigert, U. S. Commissioner of Education at this writing, is quoted as saying:

> Moving pictures in the near future will be as essential a part of the schoolroom as the wall map, the blackboard, or the spacious-backed geography.
>
> Movies will be just as much a part of the curriculum as any other study. And pupils will be required to attend the movies just as they are now required to go to the board and work out a problem in mathematics or to diagram a sentence.
>
> It is an age of pictures and I, for one, am convinced that for the future the motion picture is to forward the campaign against illiteracy as nothing else that has been adapted to the schoolroom in this era of "new-fangled" things. In nearly every small town and village, anywhere, everywhere you go throughout the country, you find the movies. They have come to stay; they are a part of our life; they are constantly being enlarged and improved. What can be done with them as a means of imparting knowledge already has been demonstrated; it is for us to use them on a larger scale and adapt them to the peculiar purposes of education.

VI

WHERE FILMS SHOULD BE USED IN TEACHING

NOT all classes can utilize the cinema in equal amount or with equal benefit. It is appropriate, therefore, at this point, to inquire into the question of *where* in the school curriculum the use of motion pictures should begin and in what branches of study their use is desirable.

In the Primary Grades

Do films belong in the primary grades? Will the kindergarten and first-grade babies be helped by motion pictures? Are there any films to be had which are suited to their needs? What is the effect of not being able to read titles? Pertinent questions these.

Psychologists and students of pedagogy maintain that children in the lower grades gain experiences most readily through the eye. The younger the child the more easily he learns by seeing and doing. As the child grows older he learns more through reason, and the written and spoken word has a greater meaning. When younger he is too young to deduce. He must first see and become familiar with his tools before he is ready to handle them.

This being true, it naturally follows that the motion picture should prove especially valuable in the lower grades. If education includes experiences by which intelligence is developed, knowledge is acquired and character formed, then the motion picture can be made

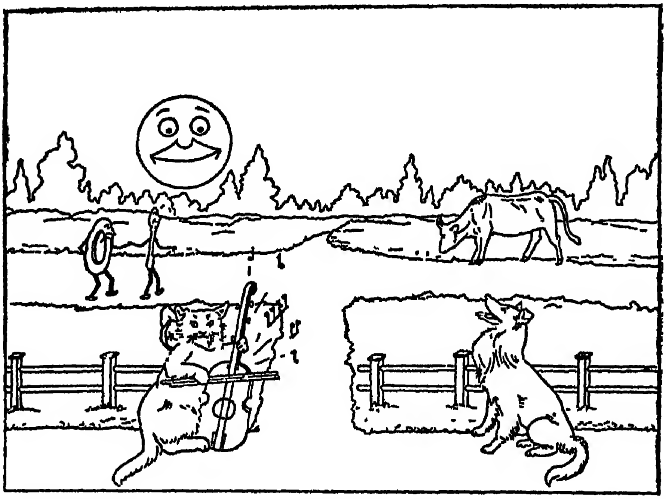
an invaluable aid to education by enriching and enlarging the child's experiences. A whole new world is thus put within reach of the child at his most impressionable age. Experience has borne out the logic of this reasoning and convinced the authors that the motion picture has a very real though perhaps largely unsuspected value in the kindergarten and primary grades, where it has been used to a very slight extent up to the present time.

A series of film lessons and demonstrations was conducted by one of the authors during the summer of 1922 as a part of a course in Motion Pictures in Education. At her disposal were some of the best informational and pedagogical films yet produced, films representative of the three general divisions mentioned in the previous chapter and suited to classes ranging from kindergarten to college. How and where to use these films to best advantage was demonstrated in a series of film lessons. We started with the kindergarten and first grade. An animated cartoon of the well-known nursery rhyme, *Hey Diddle Diddle* (NN-T), was used. One object of the film lesson was to cultivate powers of observation and perception. When the Magic Pen of Mother Goose appeared upon the screen and began to draw familiar objects and little voices piped, "I see the moon," "I see the cow," "I see the dog and the cat and the fiddle," it was plain that one object of the film lesson had been accomplished.

This simple film was scored by theatrical critics as amateurish and seized upon with delight by the primary teacher. It was effectively used by the skillful kindergarten teacher as a reading lesson, a drawing lesson, a lesson in nature study and a lesson in composition, and has been used with enthusiasm by teachers

in various sections of the country, who are clamoring for more of the same kind.

While the range of subjects which can with benefit be presented in film to the primary grades is naturally



From a series of pictures on *Mother Goose's Nursery Rhymes,* in which the Magic Pen of Mother Goose draws the pictures, and then they come to life, to the delight of the tiny tots in Kindergarten (NN-T).

limited, such subjects, as the nursery rhymes, fairy tales and simple nature study can, by means of motion pictures, be greatly enhanced in value and be clothed with a new significance. Other nursery rhymes similar to *Hey Diddle Diddle* are being made, fairy tales like *Cinderella,* and other children's classics like *Alice in Wonderland* (EK) and *Snow White* (NN-T) are obtainable to delight the child mind, and there is an abundance of simple nature study pictures to be had, showing, for example, wild animals and their young and how birds build their nests, both showing mother

love, which give an appreciation of nature to tots who have no opportunity of knowing much of nature at first hand.

There are many such films easily obtainable which the alert teacher can use to good purpose in the lower

This animated shadowgraph picture of *Snow White* is an excellent example of juvenile literature pictures.

grades, films not made for that use but which can be so adapted by the skillful teacher. A National Forest film, *Summer Fun on Western National Forests,* issued by the U. S. Department of Agriculture, made a valuable film lesson in both nature study and civics for fourth-grade pupils.

Teachers who are using films in the lower grades give interesting testimony of results obtained. A third-grade teacher says:

> Motion pictures are of great value in the lower grades as a basis for Nature work, beginning composition and a splendid foundation for geography which will be studied in the higher grades.

And a fifth-grade teacher says:

> Pictures are almost the only means many children have of gaining a knowledge of the topography of a country. Motion pictures stimulate interest in the subject and induce the pupils to do research work. Films of different industries are especially valuable to geography pupils.

And Mrs. Winifred Sackville Stoner, the well-known exponent of natural education for the wee ones, calls the typewriter and the cinema the two educational fairy godmothers.

If the reader had been present recently at the home of one of the writers when films were shown for two hours to his children and their friends, ranging in ages from four to ten, and had seen the rapt attention which the children gave to *How Birds Build Their Nests, Snow White* and *The Animal Circus* (NN-T) and heard the intelligent comments of the children and the protests when the film party was ended, he would be convinced that children of tender years both enjoy and understand pictures built for their age.

It must constantly be borne in mind, however, that the motion picture should replace nothing in schools—neither the efforts of the teacher, nor the industry of the pupil, nor the textbook, nor work with objects themselves, nor with any other aid that has proved helpful in teaching. The motion picture is essentially a supplement which makes other educational media quicker, more pleasant and more efficient.

Since the attention of the lower grades should mainly be directed towards acquiring familiarity with the three R's and since this is accomplished only by practice and drill, which the film can not supply and should not replace, a definite limitation is established here. Furthermore, at least one of the three R's is essentially

oral and aural, another manual, and neither lends itself fully to instruction by film. It is in such subjects as geography and nature study that motion pictures are proving invaluable and such films can be obtained today by any teacher who will give a little time and study to the sources of supply. The principal of more than one school has recently gone on record as saying he could secure more usable and worthwhile films on geography and biology than he could possibly use during a school year.

In Advanced Grades

The scope of the cinema widens for the pupil as he advances from grade to grade. When literature unfolds, when science replaces nature study, when history and geography come within his ken, motion pictures can contribute increasingly greater aid to both teacher and student. In the cities where motion pictures now have a place in the school curriculum their value as a teaching aid has been attested by pupil and teacher. The first report of New York's Curriculum Committee concludes with these words: "The use of films under the present plan is proving not only of definite value but is educationally sound. The school people who have been using them give their one hundred percent endorsement." In the New York schools films are used principally in the seventh, eighth and ninth grades.

The writer visited one of the New York schools the past year to observe a film lesson in biology. A lesson from the text was conducted in the classroom, then the pupils adjourned to the auditorium where a film on the *Cabbage Butterfly* (NN-T) was shwon to all seventh-grade pupils in the building. The pupils were es-

pecially interested in those sections of the film showing the insect passing from the larva to the pupa stage and finally emerging from its chrysalis a beautifully winged butterfly. They were able by means of the film to see what they would probably never have been able to see otherwise. One science teacher endeavored unsuccessfully for twenty-five years to conduct such a demonstration in real life for her class without result. The living insect never performed so that the pupils could watch the transition from one state to another, which could easily be seen by the entire class when the film was shown.

Civics, hygiene, history, geography and agriculture are also beginning to be taught and taught successfully by motion pictures in many upper grades.

In Secondary Schools

Up to this time, secondary schools are in general better equipped for the use of motion pictures than are the elementary schools. High schools are, for the most part, in larger and better buildings which contain auditoriums, and these auditoriums more often contain motion picture booths, screens, and projection machines than do the graded schools, and for this reason alone give proportionately more time to instruction by motion pictures. And it might be added, in all truth, that there is no phase of high school work which can not receive some impetus or inspiration from the cinema.

At the present time motion pictures are being used to a greater extent in the teaching of biology and geography than in other subjects, partly because these subjects lend themselves easily to handling by the cinema, but more particularly because the vastly greater

supply of educational and quasi-educational films now available fall in these categories.

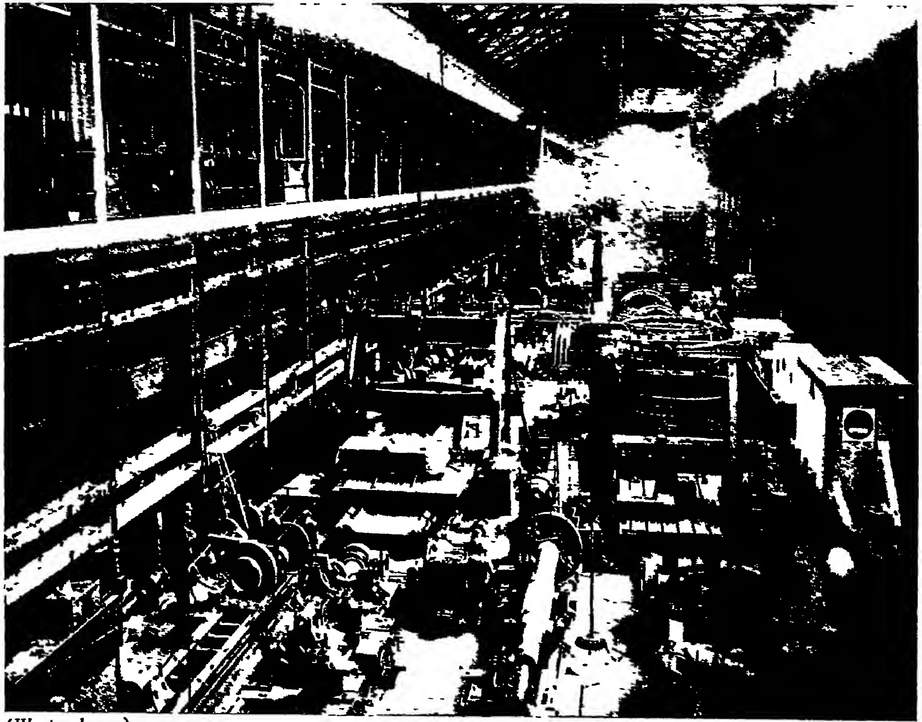
In Higher Education

Methods of instruction utilized in both the elementary and secondary schools must be utilized also in normal schools, for here must method be studied and new materials of instruction investigated.

The Wilson Normal School at Washington, D. C., and Teachers College, Columbia University, are two that may be mentioned as giving attention to the study of the various visual aids and to the use of the newest of visual aids—the motion picture.

The use of films at summer schools is increasing. During the summer of 1922 method courses in visual instruction were given at Western Reserve University, Cleveland; Agricultural College, North Dakota; College of Agriculture, University of Pennsylvania; College of Education, Pennsylvania State College; and the Universities of Kansas, Missouri, Oklahoma, Minnesota and Tennessee. At the last named the course was confined to the consideration of motion pictures in instruction, because the instructor felt there was a pressing need for specialized investigation and study of this newer type of visual aid. During the summer of 1921 a course in Educational Motion Pictures was given at Columbia University under the direction of Doctors Fretwell and Hunt, the first course of the kind. The writers participated in giving this course, in which were teachers and students from many sections of the United States, all intensely interested in this new medium of instruction.

Short courses in the use of projectors, lasting for three days to two weeks, have been given from time



(*Westinghouse*)

HOW MOTORS AND GENERATORS ARE MADE

to time at different State Universities and Normal Schools. One of the first was given at the University of North Carolina.

According to Dr. M. A. Burgess, Teachers College, Columbia, nineteen Normal Schools, Colleges and Universities have given courses in visual instruction. In addition to those already mentioned she includes the Universities of New York, North Carolina, Wisconsin, Nebraska, California, Utah, Texas Agricultural College, Cleveland School of Education, Detroit Teachers' College and the College of the City of New York.

It is unfortunate, however, that so few teachers' training schools are teaching or using visual instruction, even in jurisdictions where the schools supplied with teachers from such training schools are actually utilizing this material of instruction. In the Training School for Teachers in New York City, for example, no training is given in methods of using motion pictures, although the students are taught the mechanics of the subject, how to use a projector, etc. And the New York grade schools have gone further in utilizing film for instruction than has any other school system in the country, so far as the writers are aware!

It is exceedingly short-sighted for a normal school to send its students forth in this day with no familiarity with the use of motion pictures or training in methods for using them. The use of motion pictures in instruction is advancing with such rapidity that the young teacher going forth unequipped in this branch of work is fairly sure of being brought, early in his teaching career, face to face with the problem of utilizing this important and, to him, unknown material. Films should be used in every branch of training school work which have counterparts in regular teaching. The

young teachers should not only be well grounded in the principles underlying the application of this and other visual aids but should be given practical training and experience in their use.

The college, vocational, technical and professional schools present a vast field of their own for motion pictures.

Particularly in science will the college find in motion pictures a rich treasure house. Physics, biology, mechanics, astronomy, applied psychology and even chemistry are capable of being taught to a considerable extent on the screen.

Material experiments dangerous to perform or difficult for an entire class to follow intelligently or which require rare or excessively expensive apparatus, or very large or very minute equipment; phenomena which happen seldom or are too rapid or too slow in actual occurrence to follow intelligently; demonstrations which can be more effectively shown through animated diagrams or through other devices peculiarly the function of the cinema—these are just a few of the items in both high school and college science work which can be satisfactorily presented on the motion picture screen.

Physics films showing difficult or interesting experiments have proved a time and money saver. Films on physics showing standard experiments that demonstrate ways of producing electricity, its identity under all conditions, the molecular nature of magnetism, the difference between magnetism and electricity and Faraday's famous ice-pail experiment, establishing the fact that positive and negative electricity always appear in equal amounts, have been produced and are in use in high school physics classes and in universities.

Dr. Harry B. Lemon of the University of Chicago,

after conducting experiments in using films on electrostatics and magnetism in demonstrating lecture work, writes:

> As a result of these tests the motion picture film for the present is established in our laboratory as one of the recognized methods of undergraduate instruction.

Literature, History and Mathematics

Literature and history are, theoretically, the most obviously suited college subjects for screen presentation. Practically, the science films and industrial process films are proving the more widely used, perhaps because there is so much excellent material of this kind obtainable. Good illustrative material in cinema form can also be found for such comparatively little-studied subjects as ethnology! And who would think of teaching geometry by means of the film? Yet it has been done at the Huntington School, Boston. In the two-reel film on geometry the titles define a square, a rectangle, a rhombus and a circle, which first draw themselves and then spell out their names. The geometry student reads the definition of commensurable quantities, which means little to him. But in the second reel of the geometry film he sees a table appear and upon it a pint measure and a gill measure and a pitcher of water. A human hand appears, grasps the pitcher filled with colored liquid, fills the gill measure and turns its contents into the pint measure and repeats the process four times. There is nothing left in the gill measure. He has been shown the meaning of commensurable quantities. This geometry film was found helpful in evening classes as an interest producer and as a quick and efficient way of reviewing forgotten knowledge.

The writers, however, do not believe that this char-

acter of film can justify itself. The first reel does no more than the teacher can do at the blackboard, and do as effectively and quickly, and the second reel shows only what can be shown in front of the class, quickly, easily and more convincingly with a pint measure, a gill measure and a pint of water. Why go to the trouble and expense of showing a film? The advocates of such a film will probably maintain that more attention will be paid to the film demonstration just because it is a motion picture, and there is much evidence to support this contention.

On the other hand, the intricacies of square and cube root are admirably suited to demonstration on the screen and we are surprised that no one has yet shown us such a reel.

Chemistry

Chemistry is another subject that lends itself to film instruction. Annie L. Macleaod, Vassar College, in an article, "Motion Pictures in Teaching Chemistry," gives this interesting testimony:

> It seems to be a fact that a motion picture experiment in chemistry tends to remain fixed in memory even longer than work carried out by one's own hands. While motion pictures can never entirely displace laboratory teaching it may take the place of part of it. One instructor could handle larger sections in a laboratory after preliminary training with motion pictures, and time, apparatus and material would be saved.

Dramatic Art

The use of motion pictures in the teaching of the drama is advocated by Donald Clive Stuart, Professor of Dramatic Literature, Princeton University, who says:

> If there were in every High School and University in the

country a series of films showing the history and development of dramatic art from its inception to the present day we could begin to teach and study drama efficiently. Twenty or thirty films only would be necessary as a beginning.

Some of the greatest dramas have been translated to the screen, most of Shakespeare's plays and many more modern dramatic successes, and much of inspirational, cultural and technical value can be added to the study of the drama by viewing ably produced photoplays of suitable character. While the photoplay cannot replace the spoken drama, here again the cinema is to be used to supplement, not to supplant.

Drawing

The use of films in classrooms is by no means confined to this country. In Paris, where films are being used more and more extensively in education, drawing is being taught effectively by means of slow-motion films which analyze movement and hold life studies literally in attitudes of suspended animation. This is of inestimable aid toward anatomical precision in art work.

Films are probably being used to a greater extent in education in the United States than in any other country. Not only have they been introduced into the grammar grades and high schools in public and private schools in an ever increasing number of cities but they are also being used to a lesser extent in some of the foremost American colleges and universities. Results tabulated from questionnaires sent out to twenty or more foremost collegiate institutions show that film is being used for instruction in a wide variety of courses, including Latin, Greek, home economics, journalism, agriculture, education, athletics, architecture and

business administration, also in the military department and in colleges of medicine.

At the Iowa State Agricultural College, for example, films are being used as a part of the classroom work in applied arts, home administration, dietetics, physical culture, engineering, forestry and in the military department. Such subjects as shoes, textiles, clothing and house management were presented by means of films. The physical culture director used films to teach the causes, effects and correction of foot troubles. The domestic science classes visited food factories, famous dairies and packing houses by means of films. The engineering department saw industrial processes, mechanical operations, and technical facts demonstrated. The military department has repeatedly used motion pictures to supplement lectures. For mass instruction the pictures proved most acceptable, five hundred being given the same instruction as easily as five, and the magnification made possible by the screen permitted operations to be seen equally well by all.

At the time this is being written films are probably being used in education more in high schools and secondary schools than in either colleges or elementary schools.

In Professional and Vocational Schools

Under vocational subjects, the industries, trade processes and activities involving physical effort and manual skill are easily and effectively demonstrated on the animate screen. For the professional schools, surgery affords motion pictures the subject matter for their best performance. The superb series of clinical films, such as those produced and distributed by the Clinical Film Corporation of New York, are perhaps the highest and

best examples of truly educational films which have yet been made.

Enough has probably already been said regarding films of the U. S. Department of Agriculture dealing with farming and related industries to bear evidence that motion pictures are applicable and available for agricultural schools and colleges. Films may be obtained by Agricultural Schools on most branches of agricultural knowledge from the Department and on many branches from various state agricultural colleges and many manufacturers of farm machinery and appliances and of other commodities used on the farm.

American-made films teaching agricultural methods were sent to Russia at the close of the World War to be used in teaching the peasants more modern and improved methods. Whether or not they reached their destination we do not know, but we do know they started and we helped representatives of the Russian government in their selection.

Schools of forestry, departments of landscape gardening, veterinary schools, and schools of mines and many other engineering schools may all find motion pictures of great use.

Motion pictures are as useful in schools for the deaf as they are useless for the blind.

Specialized Study

Clubs in and out of schools, devoted to the promotion of the study of some particular subject or branch of knowledge, such as classical clubs, literary clubs, forestry clubs, etc., frequently use films as collateral material to increase a knowledge or the popularity of the subject to which they are especially devoted.

Women's clubs, such as those which pursue courses

of study on travel; benevolent organizations giving courses of instruction such as the Y. M. C. A., Y. M. H. A., the K. of C. and the community centers, settlement houses and other institutions which exercise the teaching or study function can use films advantageously.

In Religious Education

In religious instruction no less than in the imparting of secular knowledge, films have an essential function. In teaching Bible History in Sunday Schools, for example, the filmed Bible stories will give a convincing realism to characters and events not obtainable by any amount of reading or preaching and will leave impressions never to be forgotten. Many Protestant ministers of the gospel are incorporating these Bible films into their Sunday night services, while Catholic pastors and Jewish rabbis are also using them for religious instruction.

They are proving useful not only in increasing an interest in and a knowledge of the Bible, but also in solving for many churches the problem of attendance. Many ministers find a large increase in church attendance when motion pictures are added to the program of church service. Dr. Richard Cobden of St. John's Episcopal Church at Larchmont, N. Y., who is using two or three Bible reels each Sunday night, has increased his average attendance thereby from eighty to two hundred and fifty, more than three hundred per cent. And his is one of many similar instances.

"I preach the gospel at least as well as I should be preaching it if I had no pictures," writes Dr. C. S. Patton of Los Angeles, "and I preach it to one thou-

sand or twelve hundred people instead of to a handful."

Rev. C. Wesley Boag of Delavan, Wisconsin, made a six months' study of projectors and film supply before deciding to equip his church for the use of pictures and as a result the venture was a success from the start. He says:

My object was not to draw a crowd, as I already had an enviable attendance at the evening service, nor was it to compete with the moving picture theatres of my city; I am on the best of terms with them. But my object was a sincere desire to extend and enlarge the service of my church.

Good equipment is the foundation of motion picture success. The best there is is none too good for the church. Contrary to general opinion I have no trouble in finding plenty of good material. With two years of experience I now declare that I find more good material than I am able to use, and good pictures for church use are continually increasing in number.

Financing the project is very easy. Paid entertainm[illegible] solved all our problems. I believed in the benefits of [illegible] picture equipment for the church to the extent that [illegible] own pocket I paid all the expenses of installing th[illegible] Get good equipment, give good projection, sh[illegible] while pictures, put the project on a high pla[illegible] ing will care for itself.

I make use of every special occasion [illegible] Birthday, Washington's Birthday, F[illegible] July, Armistice Day, Red Cross [illegible] Thanksgiving, Christmas, etc. [illegible] example I spoke on "Carele[illegible] [illegible]hat *a Careless Hunter in the* [illegible] *[illegible]e Cost of Carelessness (Pr)* a[illegible] [illegible]e month I featured *The Great* [illegible] *[illegible]rks of God* and used *The Gran*[illegible] [illegible] *The Yosemite Valley*. These [illegible] [illegible]t great interest to those who had visit[illegible] [illegible] those who had not. Another month we had [illegible] visiting China, Japan, Egypt and France, which [illegible] a rich fund of sermon material. A total of 2,079 a[illegible] the world tour and this in a city of 3,016 population! [illegible]ere is great merit in the use of motion pictures for churches and it will pay any pastor or church to give the subject earnest heed.

We have quoted this pastor rather fully because he discusses from personal experience the matter of expense, equipment, available film supply and how he used it, and answers in a helpful and practical manner many of the questions asked by ministers who wish to use films in religious instruction.

In sacred and secular education, for the instruction of practically every type of student, from the kindergarten to the professional school, the cinema seemingly has its function, not as an educational panacea but as a valuable supplement to most teaching effort.

VII

FILMS AVAILABLE FOR INSTRUCTION

THE teacher or principal who is planning to introduce films into a given course or into a school system should study the sources of supply and make a film catalogue of his own from the catalogues issued by the various non-theatrical distributors, the lists of the National Board of Review, the weekly bulletins of the National Motion Picture League and such classified compilations as the new "1001 Film Plus," now distributed by *Educational Screen* of Chicago.

There are literally hundreds of good films obtainable today for classroom use. These may be roughly grouped into three general classes: (1) films prepared primarily for theatrical use but containing informational material of value for schools; (2) industrial films, made for advertising purposes, but showing the production, performance, or use of a commodity, service or organization; (3) strictly pedagogical films made specifically for school purposes.

Theatrical Films Suitable for School Use

One constantly hears it said by school people that films prepared for theatrical use are entirely unsuited to school purposes. Like most generalizations this statement needs to be severely qualified. While the great mass of theatrical film is not only unsuited to school use but definitely subversive of its aims, there is considerable material among strictly theatrical mo-

tion pictures which will be found exceedingly valuable for instructional use either in its original or in a modified form.

LITERATURE FILMS

Many gems of literature have been acceptably translated to the screen and these lend themselves admirably to the work of classes in literature. There is a new Italian production of *Hamlet* (NN-T) which is superbly done. The interpretation is very close to Shakespeare's, the settings are artistic and appropriate and the acting is of a high degree of excellence. The production is of a magnitude which no non-theatrical producer could have afforded to make at this stage of development strictly for school purposes, yet it is none the less of inestimable worth in the study of Shakespeare and an excellent example of the type of theatrical film suitable for school use.

There are many versions of the classics, however, too poorly done and many which depart too far from the originals to be of much educational value. On the other hand there are a fair number of picturizations of works of Shakespeare, Dickens, Dumas, Scott and other masters which merit the consideration of teachers of literature. Among the more creditable of the literature films are Dickens' *Oliver Twist* (FN), *Our Mutual Friend* (W), *David Copperfield* (UFP), *Tale of Two Cities* (F), and *Scrooge* (NN-T), Victor Hugo's *Les Misérables* (FP), Longfellow's *Village Blacksmith* (F), *Evangeline* (F), and *Courtship of Miles Standish,* Maeterlinck's *Blue Bird* (FP), Mark Twain's *Tom Sawyer* (FP), *Huckleberry Finn* (FP), *Connecticut Yankee at King Arthur's Court* (F), George Eliot's *Silas Marner* (UW), Shakespeare's

Antony and Cleopatra, Romeo and Juliet (Ps), *Tempest, Taming of the Shrew, Julius Cæsar, Richard the Third* and the *Hamlet* referred to above; Dumas' *Three Muskateers* (UA) and *Count of Monte Cristo* (F); Scott's *Lady of the Lake;* Cooper's *Last of the Mohicans, The Prairie* and *Deerslayer* (NN-T); Goldsmith's *Vicar of Wakefield,* together with other well-known classics such as *The Adventures of Ulysses* (NN-T), *Rip Van Winkle* (H), *Robin Hood* (UA), *Alice in Wonderland* (EK), *Black Beauty* (V), *Treasure Island* (FFP), *The Copperhead* (F), and such well-known works of fiction as *Way Down East* (UA), *Sentimental Tommy* (FP), *Little Minister* (FP), and *Peter Ibbetson.* The National Board of Review (address 70 Fifth Avenue, New York City) issues a list of "films drawn from books for boys and girls." This list may be obtained for a nominal sum. It gives also the names and addresses of producers and distributors from whom the films mentioned may be obtained.

Literature films mentioned and others now in the course of production may be severely scored by some teachers of literature, yet the very faults of such productions have been turned to profit by the skillful teacher. For example, the film, *The Fall of Troy* (UW), shown to Latin and history students provoked much discussion. Some questioned the authenticity of scenes and the development of the plot. The Æneid and history references were searched with avidity by students, who displayed great interest in checking up incidents and who enjoyed finding flaws in the work of the director. Though a film may not be produced as the professor of literature would produce it, it still may be used to make a most profitable film lesson if

the teacher sees the film in advance, knows its imperfections and prepares the class for them.

The problem is to adapt the present film supply to the classroom. The first thing to do is to find out what films are to be had. We have indicated some ways of obtaining additional information. We advise the practical teacher to use the best films now available without waiting for perfection. The film that one teacher may roundly condemn, another may find worthy of praise.

HISTORY FILMS

In addition to literature films, there are a goodly number of historical films based on the lives of such American patriots as Betsy Ross (NN-T), Nathan Hale (NN-T), and Abraham Lincoln (S) (FP). European history is represented by such photoplays as Hugo's *Mary Tudor* (NN-T), which is both history and literature, and other photoplays built around Henry the Eighth, Danton, Madame DuBarry (K), Napoleon (Ps) and other characters of history. A recent French production, well received at its première in London, adapted from *The Old Guard,* a novel dealing with the hopeless efforts of Napoleon's Old Guard to put the late Emperor's son, the Eaglet, on the throne of France, shows many scenes filmed in historic places such as the ballroom at Fontainebleau, the courtyard at Versailles, the Tuileries and St. Helena.

The news weeklies, shown regularly in many theatres, are patently valuable for the study of current history and certainly contain no more extraneous matter than the daily newspaper which is accepted in more or less good standing among teachers of current history and economics. Such news weeklies as *Fox News,*

Screen Snapshots, International News, Selznick News, Kinograms, Pathé News, may be used either in their original or in re-edited form. In fact Pathé is now issuing a school edition of its news weekly, which is proving of real educational value.

OTHER INSTRUCTIONAL SUBJECTS

Many choice bits of biology, physiography and other science subjects are hidden away in screen magazines and topical reviews like *Pathé Review, Urban Movie Chats* and *Kineto Review.* These need to be re-edited and correlated to school use, but to include them in a general condemnation is short-sighted folly. Many such subjects, secured by news cameramen all over the world, could not be produced for school purposes by aught but a wealthy philanthropist, yet are invaluable pedagogical material. For example, one of the most valuable parts of a highly technical film issued by the Department of Agriculture, that on *Dust Explosion in Mills and Elevators,* shows results of explosions taken by news cameramen on the spot and obtained from the news weeklies to drive home the lesson of the film.

The writer is now engaged in producing a series of text-films on general and physical geography from the Burton Holmes film library, first released through theatrical channels. Reels already completed are two each on Alaska and Hawaii and one each on Volcanoes, England and Belgium. The library contains studies of natural phenomena from many parts of the globe made during the past twenty years. It would be utterly impractical, if not impossible, to make such pictures "to order" or just as needed for inclusion in a particular school reel.

Urban's *Four Seasons,* which has had a fairly wide use in theatres, is a gem for nature study in our schools, while Bray's *Pictographs,* originally released in theatres, contained delightful bits on astronomy, physiography, biology and other short-length subjects, ranging from 100 to 500 feet, which now can be ordered according to subject matter. Some teachers have complained that the standard reel of 1000 feet taking 15 minutes to show is often unwieldy and contains too much. They complain further that they must show the entire reel, containing often much extraneous matter. Such short-length subjects as Bray has made available to schools will therefore make a decided appeal to many teachers.

Pioneers like Charles Urban and J. R. Bray have long been building up libraries of films of undoubted educational merit on a wide range of subjects, with educational showings in mind but so designed and selected that they might first be acceptable in theatres. Otherwise their release would not have been commercially practicable. These films may not be in every case pedagogically correct in their method of presentation but they contain much of pedagogical value.

NON-THEATRICAL DISTRIBUTION

Most of the films in the theatrical group are obtained from the theatrical exchanges, but such as we have mentioned are drifting more and more into film libraries of non-theatrical distributors and a few have been added to the growing film libraries circulated by the extension departments of state colleges and universities.

It is unfortunate that, with the use of films by the schools broadening out with such evident rapidity and stability, many theatrical film distributors persist either

in refusing to rent films to schools upon the demand of their short-sighted theatrical customers, or make no effort to meet the needs of this new and future field. Instead, much film of real educational value is being either actually refused to the schools because some theatre managers sense a hurtful competition or it becomes unavailable after the few months of theatre use.

Largely because of this situation and the growth, present and prospective, of the non-theatrical field, producers of films having definite instructional value are now coming to recognize the non-theatrical as their proper and ultimately more remunerative field. At the time of this writing the new Martin Johnson series of South Sea Island films has just been bought by a non-theatrical distributing company instead of by the theatrical field in which the earlier issues of this series were released. It has now come to pass that exceedingly few educational films, outside the news weeklies, can be a real financial success, except those which are made in features proportions, such as *Nanook of the North* (P), *The Bottom of the World* (NN-T), and the *Head Hunters of Malachi* (NN-T), and these will be in demand by the schools long after their usefulness in the theatre has passed.

Industrial Films

The industrial films, the second and largest of the three general groups of films available today for schools, may easily be adapted for special classes and have been used with more or less satisfying results in many schools and colleges.

Films in this group, which are made primarily for the purpose of advertising, range all the way from the rankest experiments of amateur cameramen to finished

works of art, rivaling the better class of regular productions. Some are merely advertisements; others, while informative to a limited degree are vitiated for school use by their character or their large amount of sales promotion. But there are a large number of films to be had which, though built for the purpose of advertising, sales promotion or propaganda, are of such a character that they are of great value for education.

Many of these films are devoted to the great essential industries of the country—mining, the steel industry, sugar production, shoe manufacture, the making of automobiles and watches—"how-things-are-made" films. Some contain lessons in domestic science, how to can fruit or make bread; some show how certain commodities operate, such as farm tractors and washing machines; some teach the care of the teeth and eyes, how to care for the sick, the food value of milk and a myriad other useful subjects.

One industrial film, which the writer made for a manufacturer of motor cars, called *The Porcelain Lamp* (NN-T), portrays the story of how gasoline was discovered as an explosive fuel, then gives an authentic picture of the entire history of land travel from the earliest form of human transportation to the methods used at the present day and finally shows how the various parts of the modern motor car perform. The particular make of car of the manufacturer for whom the picture was produced, is, of course, used as the example of the modern automobile, but this factor is greatly subordinated. The film has proved to be of real educational value to classes in history, manual training and for general information in school assemblies, and is a good example of the industrial film that can be and has been satisfactorily adapted to school use.

(Forest Service)

CONSERVATION LUMBERING

Many such industrial films, financed by large commercial firms, are far more complete and ably done than the more economically made pedagogical films, which, though designed primarily for instructional use, have been hampered in their making by insufficient funds. Educators owe a very real debt of gratitude to business corporations for the many high-class films they have rendered available for education at no expense to the educator, for industrial films are obtainable free except for transportation.

The brains of business are discovering that there is no way of showing the results of their efforts so graphically, so clearly, so convincingly and withal so truthfully and effectively as through skillfully built motion pictures. Such pictures can go to the very heart of an industrial process, analyze and lay bare the most intricate inner workings of its machinery of production, demonstrate, through the use of the ultra-speed camera, analysis of motions too rapid for the eye to take in at natural speed, present in animated mechanical drawings and diagrams processes so rapid that they must be slowed down perhaps 100 or more times to be discernible or so intricate that no direct photograph can reveal them, show in graphic concrete form abstruse generalities, and display the subject matter so impressively that a lasting concept results.

But their scope is not confined to showing processes; they go deeper, portraying the development, the evolution of an industry, the influence which it has had upon the history and growth of a country or upon civilization itself and its significance in the commerce of the world. They truly present the romance of business, the marvelous story of world commerce, the great driving force

which molds the destinies of nations and controls the guiding body of world development.

Films of this character are being made by leading motion picture producers for commercial institutions of national and international scope and reputation. Pictures produced under these combined auspices must necessarily be of excellent quality from the standpoint of film technique and of high educational value.

Are they suitable for school use and are they available for that purpose? Do they treat of subjects in which the schools are interested? Do they treat of them in a way that will prove acceptable and helpful to the schools? Does the fact that they carry a certain amount of advertising make them less acceptable or valuable for school use? And can they be obtained by schools and other educational institutions?

Schools are certainly concerned with the elements entering into commerce. If education is a preparation for life in a world of commerce and industry, pupils should be given an insight into industrial and commercial processes. It is well that the pupils be taught how coal is mined, how copper and iron are mined, smelted and manufactured, how iron and coal are used in making steel, how steel, in turn, is made into locomotives and ocean liners and pen-knives and a thousand other things which help keep this old world busy and moving.

Geography and history, civics and economics are made of just such stuff, and the practical application of mathematics, physics, chemistry, geology, metallurgy, and other sciences is found in these very industrial processes. It is for these reasons that classes are taken on field and factory expeditions—through glass manufactories, sawmills, textile mills, paper mills and

power plants—in order that they may see concretely and at first hand how various commodities are made or other industrial results are produced. But such excursions take time, and no school is able to show its members more than a very few of such plants. Industrial films have been and are being made which show industrial processes and the production and use of commercial products far more clearly, graphically and thoroughly than any trip through a plant could possibly reveal. Other films of this general nature are designed to spread health, sanitation and safety-first propaganda, to make known to the citizens of a state or a city how its institutions are organized and directed or to accomplish some similar purpose.

Certainly these subjects are of interest to schools and have a place in their courses of study. The animated mechanical drawing is one feature of industrial films which is of outstanding instructional value. This is a device which reproduces on the screen in striking clearness the most complicated of mechanical and other involved processes and is capable even of presenting abstract ideas in concrete, diagrammatic form and operation. By this device the inside operation of machinery, as of an automotive engine, the movement of a current of electricity, the nervous impulses of man, the movement of the heavenly bodies, molecular motion, and even involved mental processes can be shown clearly, simply and vividly. Its accomplishments and possibilities for effective instruction make it invaluable for school use.

The second question, as to whether industrial films treat their subject matter in a way acceptable and helpful to schools, can not be answered categorically. Industrial films differ radically in quality and treatment.

The correct production of an industrial film demands other qualities than are called for in photoplay production, not necessarily greater but radically different The photoplay is produced usually under ideal conditions, with proper lighting and settings, professional actors and competent staff; the industrial often under exceedingly difficult ones, poor lighting, next to impossible settings, camera-shy and self-conscious actors, incompetent coöperation and outside interference, and the director and cameraman must, if they are to produce a successful result, not only overcome these difficulties but create a picture which will be clear, graphic and of compelling interest. The producer of an industrial of merit must combine with his motion picture art the qualities of a pedagogue and a salesman. Some industrials are made by those who are skilled cameramen and little else. Of course, it is assumed as an initial premise, that the photography of an industrial is beyond reproach, though it must be admitted that many are impossible even from this standpoint. Others are beyond criticism as pictorial presentations of processes but have neither pedagogic qualities nor ability to hold the interest of the spectator, much less create a graphic or lasting impression. And so the gamut of faults might be run for many pages.

Industrial pictures containing glaring shortcomings of serious nature are of course not suitable for instructional use. Schools should, therefore, first assure themselves of the character of their source of supply, if they would save themselves the task of endless advance film inspection or the danger of imposing an altogether unsatisfactory product upon their student bodies. Fortunately there are many excellent industrial films in existence produced by experts of recognized

ability in the industrial film field, who have not had to spare expense or pains in building their pictures and have had the coöperation of business firms with large capital and every disposition to enable their producers to construct a film of the highest possible merit. Films produced under such auspices have a decided advantage over many strictly pedagogical pictures made under the stress of rigid economy for a school market as yet but meagerly financed. The presence of advertising will not in itself render a film unsuited and unacceptable for pedagogical use. Rather will it add to its authenticity. When a class visits a manufacturing plant to see how pins or automobiles are made, they do not avoid those which have their name plates on the doors, and an industrial film is merely the factory brought into the school. Of course, advertising can be so blatantly overdone that it overshadows all else, in which case we have not a picture but an animated house organ. The writer has in mind, however, the moderately conservative type of truthful presentation.

The truthfulness of the presentation is a factor which should be carefully weighed. Obviously nothing which savors of the rabid exaggerating press agent has place in a school. Assuming, however, that the school is receiving its industrial film service from a producer who adheres to the slogan, "Truth in Advertising," the fact that the film bears acknowledgments to the manufacturer is an asset rather than a liability. Besides adding authenticity it usually, if made by a competent producer, insures quality, and enables the school, in most cases, to obtain a valuable product for no more than transportation costs, and this is an important factor at a time when the schools are exceedingly short of much-needed appropriations. In this connection

schools and other exhibitors should certainly not be charged for industrial films for which the manufacturer has already paid. It scarcely seems ethical to levy a service charge for a product already financed by the advertiser.

This brings the writers to the last consideration. Can industrial films be obtained by educational institutions? They are available from many sources. In most cases the commercial manufacturers who have films themselves will gladly lend them. The film producer can in most cases either lend the film himself or put the inquirer in touch with his clients from whom the film may be obtained. If the producer be a large concern and distributes his own productions directly, the school is able to obtain a regular service from him and is saved the trouble and inconvenience of having to depend upon many different and widely scattered sources of film supply. Some industrials may be obtained from Extension Departments of State Universities.

The Bureau of Foreign and Domestic Commerce at Washington has, in coöperation with the Bureau of Mines, supervised the production of a number of industrial films relating to essential industries, particularly the metallurgic industries of the country. Most of these films have been financed by private capital but contain a minimum of advertising. They may be obtained by educational institutions from the Bureau of Foreign and Domestic Commerce, Washington, D. C., or the Bureau of Mines, Pittsburgh, Pa. The library contains such subjects as *The Story of Corborundum,* the *Story of Copper, The Story of Petroleum, Mexico and Its Oil,* the *Story of Sulphur, Alloy Steel, Oxygen, The Wonder Worker, Water Power, Compressed Air, Transportation, The Story of an Electric Meter, Ma-*

chine Tool Manufacture, The Story of Steel, Abrasives, The Story of Portland Cement and *The Story of a Watch.*

Large manufacturing concerns such as General Electric Company, Schenectady, N. Y.; Western Electric Company, New York City; Northeast Electric Company, Rochester, N. Y.; International Harvester Co., Chicago, Ill.; National Cash Register Co., Dayton, Ohio; U. S. Steel Corporation, New York City, and the various railroad systems have some excellent industrial films for free distribution. Industrial films produced by different companies and business organizations may also be obtained through the Industrial Department of the International Committee of Young Men's Christian Associations, Madison Avenue, New York City, and from the Bureau of Commercial Economics, Washington, D. C., which is not either directly or indirectly connected with the Government but is entirely a private commercial enterprise.

A fourteen-page list of industrial films, arranged alphabetically, has been compiled by the National Board of Review, New York City and may be had for a nominal sum. The Board of Review does *not* produce or distribute films but does furnish information regarding the theatrical films they review and some non-theatrical films. We recommend that the educator who is planning to use industrial films secure this list and also the catalogues of the Bureau of Commercial Economics and of the Y. M. C. A.

There is so much of value to be found in the large group of industrial films that time and effort to locate them are well spent. In making application to distributors of industrials it is well to make the request early, six weeks or two months in advance, and also to give

a second, third and fourth choice in case the first film mentioned is in use elsewhere. Film libraries are much like book libraries—the subject wanted is apt to be out when another borrower calls or sends for it; therefore the advisability of putting in the order or request early, or better still of making out the film program for the entire school year during the summer vacation.

It is very common for schools to find all manner of fault with the film exchange when they can not get the film they want when they want it; yet when one wants a certain book from a library one does not hold the librarian responsible when the book is in use elsewhere and no copy is available. The initial cost of films is considerably greater than that of books; so the exchange is less likely to have enough copies always to go around.

A list of industrial films that have been used by schools would be too long to give here but the following are examples of industrial films used in the New York Public Schools for classroom instruction during 1922-1923: *From Cow to Consumer* (Ps), *Blue Monday* (NN-T), *Our Daily Bread, Story of the Orange* (A), *Cheese Making, Oral Hygiene.*

The Franklin School, Port Arthur, Texas, has used the following industrials in a course in visualizing geography: *Conquest of the Forest* (SGE), *Shoe Making* (DW), *Cotton Cloth* (AM), *A Woolen Yarn* (SGE), *Tale of a Thirsty Towel* (ARC), *Coal Mining* (YMCA), *Story of a Stick* (LB), *From Texas Trail to Your Table* (A), *The Spirit of the Corn* (CP), *From Mine to Mint* (BCE) and *The Sugar Trail* (BCE).

And at New York University, in a course in Industrial Processes, the School of Commerce, offered for the first time in 1922, the subject matter is being presented

entirely by motion pictures. Each picture used in the course is accompanied by an adequate explanation of the principles involved. Starting with the basic industries, such as coal and iron mining and steel making, the course presents in detail the various stages through which raw materials pass until they come out finished products.

It is apparent that for several years to come, while the strictly pedagogical film field is developing, the correctly produced industrial film will be a leading popular type of film for use in the schools and that when the pedagogical film does come fully into its own, as it is coming surely and rapidly, the industrial will remain its most valuable supplement. And for use in commercial education it will never lose first place, for it contains the prime essentials of the highest type of instruction in the industrial and business life of the world.

VIII

FILMS AVAILABLE FOR INSTRUCTION
(Continued)

Pedagogical Films

THERE is a third group of films usable for instruction in which should be included not only those films which have been actually photographed for instructional purposes solely or primarily but also those which have been thoroughly correlated and edited for school use.

Examples of specially made pedagogical films are *Magnetism* (SVE), a series on Physical Geography and Athletics (VT), and the Park Popular Science films on Physical Geography (NN-T), a series treating first of the geography of the universe and then developing logically from cause to effect, and which consider the earth as a planet, explain time, the seasons, storms, ocean currents and the Gulf Stream. Later reels treat of commercial geography presented as growing out of physical geography.

Of the films which have been correlated and edited for instructional purposes, good examples are the text films on Alaska and Hawaii (NN-T), recently compiled by the writer. These pictures, each two reels in length, are divided, as are some of the standard textbooks on geography, into three parts, treating first of the physical character, then of the resources and industries and finally of political geography and history. The films are introduced by animated maps which establish the locations and characters of the territories, principal cities, mountains and other features. The

titles are written from the standpoint of the teacher of an upper grade.

A fairly large number of films in the two classes of pedagogical films have made their appearance and others of varying grades of excellence are now appearing with a moderate degree of rapidity. Most of such films are on the subjects of commercial and general geography, biology, hygiene and agriculture, with fewer on civics, physical geography, literature, physics and history, and fewer still on such subjects as chemistry and mathematics.

A clear distinction must be made between the true pedagogic films prepared from the teaching angle and informational films on the subject of travel, natural history, animal and plant life and others fundamentally educational but prepared for entertainment. These informational films are undoubtedly of use in education as collateral material or even for direct instruction, but they have not the direct and effective teaching value possessed by that small but increasing group of pictures prepared as teaching media. Good examples of this type of film are *The Trap Door Spider* (PC), *The Lincoln Cycle* (C), and *American Author Series* (U).

The classified lists of some of the larger distributors of pedagogical films may be helpful. To give a complete list of such films in a volume of this character would be impracticable. The following will, however, give a fair idea of the kind of films obtainable.

SCHOOL FILMS OF THE SOCIETY FOR VISUAL EDUCATION, INC., CHICAGO

Foundation and Settlement of the United States

French Explorations in North America
English Settlements in North America

Struggle of French and English for North America
Breaking Through the Appalachians
War of the American Revolution
Settling the Ohio Valley
The Louisiana Purchase and the Lewis and Clark Expedition
Trans-Mississippi Trails
Across the Rockies to the Pacific

Economic History of the U. S.

The Steamboat in U. S. History
Canals in U. S. History
Railroads in U. S. History
Reclaiming Arid Land by Irrigation
Immigration to the U. S.
The Panama Canal and Its Historical Significance

Civics

A Citizen and His Government (2 reels)
Growth of Cities and Their Problems
"Hats Off"—A Story of the Flag

Health and Sanitation

Getting Acquainted with Bacteria
Waste Disposal in Cities
Unhooking the Hookworm

Mathematics

Animated Geometry (2 reels)

Physical Geography

The Earth and Worlds Beyond
Study of a Mountain Glacier
The Work of Rivers
Study of Shore Features—Low Shore
Study of Shore Features—Bold Shore
Formation of Caves in Limestone
Formation of Volcanoes and Geysers
The Story of Coral Growth
A Study of Niagara (2 reels)

Regional Geography

New England (2 reels)
Middle Atlantic States (2 reels)

Southern States (2 reels)
Central Plains (2 reels)
Great Plains
Western Plateaus
Rocky Mountains
Pacific Mountains and Lowlands

Nature Study

Where Plants Live
The Monarch Butterfly
Samia Cecropia, the Giant American Silkworm
Pond and Stream Life (2 reels)
The Mosquito
Toads
Wasps

Physics

Famous Experiments in Electricity and Magnetism (Produced at Ryerson Physical Laboratory, University of Chicago) (6 reels ready)
Magnetism
Electrostatics
Electromagnetism (2 reels)
Electromagnetic Induction
High Frequency Currents

TEXT FILMS DISTRIBUTED BY NATIONAL NON-THEATRICAL MOTION PICTURES, INC.

NEW YORK CITY

BIOLOGY

Text-Films (one reel each)

Microscopic
The Microscope and Its Uses
Blood Circulation (1 reel and 3 reels)

Insect Life
The Blue Bottle Fly
The Cabbage Butterfly
The Silk Worm
Bee Culture

Bird Life

The American Fish Hawk
Birds of the Sea
A Day with the Sea Gull
How Birds Build their Nests
The Peregrine Falcon
The Sea Birds' Paradise
Web-Footed Swimmers of Mountain Lakes
Winged Hunters, The Merlin

Botany

Field Flowers

Aquatic Life

Zoology—Aquatic Life

Mammals

The Reindeer
Elephant-Seal Hunting
Wild Life Studies—North America
Wild Life Studies—Africa
The Bottom of the World
Life in the Antarctic
Wild Animals and their Young

LITERATURE

Shakespeare's *Hamlet*	7	reels
Dickens' *Dombey and Son*	6	"
Homer's *Odyssey*	5	"
Homer's *Odyssey*	3	"
Dumas' *Corsican Brothers*	5	"
James Whitcomb Riley's *The Adams Boys*	1	"
James Whitcomb Riley's *Little Orphant Annie*	5	"
Hugo's *Mary Tudor*	5	"

Tense Moments from Great Stories
(one reel each)

Merchant of Venice, Shakespeare
Macbeth, Shakespeare
A Tale of Two Cities, Dickens
Bleak House, Dickens
Scrooge, from Dickens' *Christmas Carol*
Fagin, from Dickens' *Oliver Twist*
Nancy, from Dickens' *Oliver Twist*
Vanity Fair, Thackeray

History and Patriotism

Betsy Ross ....5 reels
Nathan Hale ....5 "
Daughters of the War ....5 "
The Red Peril ....5 "
Is America Worth Saving?..2 "
Uncle Sam of Freedom Ridge..2 "
Uncle Sam of Freedom Ridge..5 "
Prehistoric Americans ....1 "

Text-Films

Historic Cape Cod ....1 reel
Historic Monterey ....1 "
Historic St. Augustine ....1 "
Historic Virginia ....1 "
Battlefield of Gettysburg ....2 reels
Battlefield of Chickamauga ....2 "

U. S. Geography

Burton Holmes Series
- *Alaska* (Text-Film) ....2 reels
- *Alaska* ....6 single "
- *Hawaii* (Text-Film) ....2 "
- *Hawaii* ....5 single "
- *Philippines* ....30 single "
- *Cliff Dwellers of America* ....1 "

National Park Series Text-Films (one reel each)
- *Grand Canyon of the Arizona*
- *Yellowstone National Park*
- *Rainier National Park*
- *Pike's Peak National Park*
- *Battlefield of Gettysburg*
- *Battlefield of Chickamauga*
- *Crater Lake National Park*

Other Scenic Wonders (Text-Films (one reel each)
- *Mt. Lowe, Calif.*
- *Beauty Spots of New Hampshire*
- *Hudson River*
- *Lake Mohonk, N. Y.*
- *Lake Placid, N. Y.*
- *Niagara Falls, N. Y.*
- *Watkins Glen and Ausable Chasm, N. Y.*
- *Thousand Islands*
- *Columbia River, Ore.*
- *Mt. Hood, Ore.*

Willamette Falls, Ore.
Delaware Water Gap, Pa.
Mt. Baker, Wash.
Mt. Takoma (Rainier), Wash.
Delles of Wisconsin
Heart of the Blue Ridge, W. Va.

Regional Geography Text-Films (giving physiography, resources, industries and principal cities) (2 reels each)

New England States
Middle Atlantic States
South Atlantic States
E. North Central States
E. South Central States
W. North Central States
W. South Central States
Mountain States
Pacific States

General Geography

Text-Films (treating of physiography, resources, industries and politics)

Australia ....2 reels
China ....2 "
India ....2 "
Races of Mankind ....2 "

Burton Holmes Travel Series
300 single reels on 48 countries

Physical Geography

Text-Films

The Evolution of a Solar System
The Mystery of Space
Earth and Moon
Night and Day
Time
The Bottom of the World
The Seasons
Gravity
The Kingdom of the Storm
Ocean Currents
The Gulf Stream
Volcanoes (Burton Holmes)

Commercial Geography

One reel each

Evolution of Travel
Evolution of Wash Day
Rebuilding French Industries
Reclamation and Water Projects of the United States

The following industries:

Airplanes (U. S. A.)
Automobiles (U. S A.)
Bananas (Fiji Islands)
Batik Cloth (Java)
Coconuts (Philippines)
Coal Mining (France)
Coffee (Hawaii)
Copra (Samoa)
Dairying (U. S. A.)
Gold Mining (Alaska)
Hats (Philippines)
Linen (Sweden)
Lumbering (U. S. A.)
Lumbering (Siam)
Lace (Philippines, Belgium)
Pottery (U. S. A.)
Rice (Philippines, Siam, Formosa, Japan, Java)
Rubber (South Seas)
Salmon fishing (U. S. A.)
Salt (Philippines, Formosa)
Silk (Japan)
Sugar (Hawaii, Java, Philippines)
Tires (U. S. A.)
Tobacco (Philippines, Siam)
Whaling (Atlantic Ocean)
Wheat (U. S. A.)

HEALTH, HYGIENE AND ATHLETICS

How Are Your Teeth? ....1 reel
Walking to Health ....1 "
U. S. Naval Academy Series
  Boxing Instructions ....2 "
  Swimming Instructions ....1 "
  Wrestling Instructions ....1 "
Sport Reviews ....26 "
  Single reels on every branch of athletics
Home Nursing
  The Eleventh Hour ....2 "
  Her Penalty ....2 "

The Educational Department of Pathé has issued a series of Screen Studies accompanied by *Teachers' Aid* leaflets. The number of subjects especially edited for school use is small. They are as follows:

Ants: Nature's Craftsmen. 1 reel (Nature Study).
Athletic Movements Analyzed. 2 reels (Slow Motion).
Felling Forest Giants. 1 reel (Lumbering).
Yosemite, Valley of Enchantment. 2 reels (Natural Color).
Brer Rabbit and His Pals. 1 reel (Rodents).
Animal Camouflage. 1 reel (Resemblance and Mimicry).
Birds of Prey. 1 reel.
Molluscs. 1 reel.
Crayfish and the Stickleback. 1 reel.
Our Four-Footed Helpers. 1 reel.
Mealtime in Birdland for Parents and Babies. 1 reel.

Pathé is also producing a series of Historical Scenics. The first three have been released. They are: *Land of our Forefathers* (The Settlement of Jamestown, 1 reel), *The Pilgrims of New England,* and *The Dutch Settlement in New York.*

The *Pathé Review* contains much educational material which is being used in schools. It would prove even more valuable in teaching if short lengths on a single subject were obtainable, instead of full reels on several different and often unrelated subjects.

The Fox Film Corporation has recently established an Educational Department. The educational film library includes, in addition to theatrical subjects like *Les Misérables* and *Tale of Two Cities,* a dozen or more reels of *Fox News* material re-edited for school use. Among them is an excellent reel on *Volcanoes,* and others on *Fires and Fire Fighting, Old Spain, Ancient Rome, Japan Today,* and *Bird Life.*

The large library of Bray Productions, Inc., which has been built up during more than ten years, contains short lengths, ranging from less than one hundred feet to a full reel of a thousand feet, on a great variety of subjects grouped under the generic headings: Philosophy, Sociology, Natural Science, Useful Arts, Fine Arts, and History. The complete list is too long to give here. A catalogue can be obtained on request.

The Community Motion Picture Service of New York, the Ford Motion Picture Laboratories of Detroit, the Carter Cinema Company of New York and the Visual Textbook Publishers of Los Angeles are among other firms distributing films for school use. A complete list of such firms will be found in the Appendix.

(*National Non-Theatrical Motion Pictures, Inc.*)

BIBLE STORIES IN MOTION PICTURES

1. Solomon's Court 2. The Deluge

Religious Subjects

Of great interest to denominational schools as well as to Sunday schools and churches are the films of the Bible. There are now being distributed two series of very beautiful films on the Old Testament, several well-made picturizations of the birth, life and death of the Saviour, such as *The Eternal Light* (CA) and *Behold the Man* (P), and several series of films on the Holy Land and on home and foreign missions. Some of the Parables have been filmed and another series of these is about to be made and there are many modern religious photoplays to be had, such as *The Stream of Life* (PI) and *The Burning Question* (CA).

One of the Old Testament series referred to above (NN-T) is a series of fifty-two reels made on original locations in Palestine and Egypt and covers most of the great events recorded in the Old Testament and in a stupendous fashion. The series includes such episodes as *Creation, Cain and Abel, The Deluge, The Stories of Abraham, Sarah, Isaac, Jacob and Esau, The Story of Joseph, Moses, Ruth* and *Solomon.* Some of these films, which are entirely non-sectarian, are being used in the public schools solely as literature, and the New York Board of Lectures recently used the Joseph and Solomon episodes as a feature of the Sunday afternoon sacred concert and dramatic recital which marked the opening of the observance of drama week in the city schools.

Mr. Roy L. Smith, pastor of Simpson Methodist Church, Minneapolis, summarizes the case for the motion picture in the church so well that we can do no better than to quote him at length. He says:

The objection—that pictures in the church is an endorsement of pictures everywhere—is easily answered. The chil-

dren are going everywhere anyhow. They are seeing the good and the bad. If the church does nothing to teach the child to discriminate, then the church herself is at fault. But does the church's use of selected pictures give sanction to all moving pictures? No! The church organ does not sanction "jazz." The Sunday School library is not an endorsement of "yellow backs" and "dime novels." The church orchestra does not lend approval to the lewd in music. Thus far the church has either ignored the question, condemned pictures wholesale, or begun in a modest way a campaign of education. I believe the latter is the wiser course and have organized our work accordingly.

Where Film May Be Used—1. Instruction in doctrinal beliefs; 2. Implanting the moral virtues; 3. Biblical history, customs, geography and stories; 4. Home and foreign missions; 5. Church history; 6. General educational purposes for special organization meetings such as boys' or girls' clubs, men's meetings, etc.

Pictures possess certain advantages and values that should appeal particularly to the educator in the religious field. Scientists and psychologists have long declared that eighty-five per cent of our education comes through our eyes. Religious education, until late years, however, has appealed almost exclusively to the ear. Pictures that adequately present the message will be found to have unusual advantages because of their natural and scientific appeal.

The stories of Bible heroes and incidents are being produced in larger quantity than in former years.

Much of the biblical material is only partially understood because of the ignorance concerning the social conditions under which it was written. Many films are now obtainable which faithfully depict oriental life in such a way as to make the Bible times re-live before our eyes. The habits and customs of the Orient have changed so little during the last two thousand years that modern pictures serve almost perfectly.

The use of film in connection with women's work presents unusual opportunities. Practically all churches have women's guilds, missionary societies, or other similar organizations. I have found that a portable machine makes it possible to take missionary films, educational reels, etc., right to the homes where the meetings are held and the use of pictures has been a considerable addition to their regular programs.

We are frequently questioned as to the results obtained from our picture programs. Perhaps the best answer is the action of our official board, which has constituted the com-

mittee of management a permanent organization of the church and made it answerable to the governing body of the church on the same basis as the Sunday School. This means that we are definitely committed to the work. Our Sunday School has increased one hundred per cent since the introduction of pictures, both in attendance and enrollment.

The production of strictly pedagogical motion pictures is increasing as the market for them expands and the quality as well as the quantity grows. It is expected that the next few years will witness a keen rivalry in pedagogical film production.

Among the most promising of the productions under way is a series being produced by "The Chronicles of American History, Inc." in coöperation with Yale University. A series of one hundred subjects in American history is planned. The first subject, *Columbus and the Discovery of America,* has been completed but is not to be released until the first group of nine subjects is completed. The films are being exceedingly well made, with great attention given to accuracy of detail and to teaching value.

The schedule of the pictures planned and actually in the process of making has been announced as follows:

I. THE MORNING OF AMERICA

NINE PLAYS IN TWENTY-TWO REELS

	Reels
1. Columbus	3
2. Pocahontas (Jamestown)	3
3. The Pilgrims	2
4. The Puritans	2
5. Peter Stuyvesant	2
6. William Penn	2
7. Maryland	2
8. The Gateway to the West	3
9. Wolfe and Montcalm	3

II. THE WINNING OF INDEPENDENCE

Seven Plays in Sixteen Reels

10.	Lexington (Paul Revere)	3
11.	The Declaration of Independence (Bunker Hill)	3
12.	Saratoga (Burgoyne)	2
13.	Valley Forge (Lafayette)	2
14.	Vincennes	2
15.	Benedict Arnold (Rochambeau)	2
16.	Yorktown (Greene and the Carolina Campaign)	2

III. THE YOUNG REPUBLIC

Six Plays in Sixteen Reels

17.	Benjamin Franklin (The Treaty of Peace)	3
18.	The National Domain (John Sevier)	2
19.	The Constitution (Washington)	3
20.	Alexander Hamilton	3
21.	Jefferson and the Barbary Pirates	3
22.	Marshall (The Steamboat Case)	2

IV. THE VISION OF THE WEST

Eight Plays in Twenty-two Reels

23.	Daniel Boone	2
24.	Lewis and Clark (Louisiana)	3
25.	The Battle of Lake Erie (Perry)	3
26.	Monroe Doctrine	2
27.	Old Hickory	3
28.	Old Oregon (Astoria)	3
29.	The Alamo (Sam Houston)	3
30.	The Gold Rush and the Vigilantes	3

V. THE CIVIL WAR

Six Plays in Eighteen Reels

31.	The Fight for Kansas	4
32.	Abraham Lincoln	4
33.	Grant and Farragut	3
34.	Stonewall Jackson	3
35.	Jefferson Davis (The Emancipation Proclamation)	2
36.	Lee and Appomattox	3

VI. THE AGE OF POWER

Five Plays in Twenty-five Reels

The transformation caused by the inflow of immigrants and the development and utilization of mechanical power on a great scale; picturing invention and the mechanical revolution and the America of today.

Another admirable film, on Christopher Columbus and the Discovery of America, made partly in Spain and partly in this country, a film which is detailed, accurate and well done, is now in completed form and will probably be released within the next few months.

To say that all so-called pedagogical films now on the market are suited to school use would be as wrong as to condemn all not made for education. Judicious selection must in all cases be made, with the consideration in mind that it is short-sighted and unreasonable to expect perfection in teaching films at this stage of their development. Do we refuse to use textbooks and dismiss teachers because they have not yet attained perfection? There are some exceptional films as well as exceptional teachers; there are also some that are only fair and others that are poor. Why demand "perfection or nothing" in a product of such recent birth as the cinema?

If the film you are considering using has much of good and helpfulness in it and will make more effective the teaching you are doing, meet the producer half way and use the helpful films he has to offer, until a more satisfactory production is made. The producer is probably doing his best to meet your needs under exceedingly discouraging conditions, and by your co-operation and constructive criticism you will enable him the better to meet your needs later.

Some pedagogical films made by educators, who have loudly condemned types of educational films already produced, have proved to be equally unsuited for school use—"educational misfits," as one director of visual education pronounced these teacher-produced films brought to his attention. Their educator-producers were obviously wholly ignorant of the essentials of film production and the result was as unsatisfactory as the films they themselves so roundly condemned.

Films Shown to the N. E. A.

The Visual Instruction Association of America, at its first meeting held July, 1922, at Boston, in connection with the National Education Association, exhibited a series of carefully selected instructional films, all of which had been used in the public schools of Greater New York during the year 1921-22. The list appropriately illustrates the types of films now being used with success and is therefore given in its entirety.

Geography	Reels
Hawaii (NN-T)	2
Yellowstone (U)	1
Niagara (SVE)	1
Seasons (VT)	½
Yosemite (P)	
Volcanoes (NN-T)	1
Bottom of the World (NN-T)	3
Bethlehem Road (Ge)	1

Biology	
New York Aquarium (K)	1
Ants (P)	1
Wasps (SVE)	1
Baby Song Birds (P)	2

Manual Training and Domestic Science	Reels
Mitchell Car (M)	1
Daily Bread (SVE)	1
Pantry Cow (PSC)	1
Soap Manufacturing (K)	1
Fire Prevention (F)	2

Physical Education	
The Kid Comes Through (E)	1
Athletic Movements (P)	1

English Literature	
Washington Irving (U)	1
Longfellow (U)	1

Civics		Juvenile	
News Reel No. 53 (P)	1	Hey Diddle Diddle (NN-T)	½
Immigration (W)	1	Cinderella (I)	3
Gethsemane (Ge)	1	Our Mouth (Gr)	1
Knights of Cross Roads (A)	2	How We See (B)	1
Bell of Atri (AHS)	1	Physical Fitness (W)	1

The Board of Education of the City of New York issued the following list of films used in its schools, paralleling the regular curricula, during 1921:

FILMS IN BIOLOGY

SUBJECT	TITLE OF FILM
1. Structure and Life Activities of One-Celled Animals	Life History of the Amoeba (U) Behind the Microscope (NN-T)
2. Adaptation to Environment	Adaptation (A) Beaver (E)
3. Moths and Butterflies	Cabbage Butterfly (NN-T) Cecropia Moth (C)
4. Study of Bees	Honey Bee (Ca) Bees (NN-T)
5. Insects Harmful to Man	House Fly (Ca) Mosquito (C)
6. Aquatic Life	
7. Birds and Their Young	Chaffinch and Young (C) Sea Swallows—Birds at Home (A)
8. How Life Begins (Ca)	
9. How Life Begins	
10. The Eye	Through Life's Windows (WF) How We See (B)
11. Ear and Speech Organs	Living Voice (B) How We Hear (B)
12. Care of the Feet	Foot Follies (E)
13. Oral Hygiene	Mouthful of Wisdom Oral Hygiene (B)
14. Circulation and Breathing	Circulation (NN-T) Work of the Lungs (B)

FILMS IN BIOLOGY—(*Continued*)

SUBJECT	TITLE OF FILM
15. Conservation	Forests of the Future (CC)
16. Civic Biology I.	Keeping a Big City Clean (A)
	Scientific Milk Production (Sh)
	Health Department (A)
17. Museums and Aquarium	Bits presented by various producers to the American Museum of Natural History (AM)
	Aquarium (K)

FILMS IN DOMESTIC SCIENCE AND HOME ECONOMICS

SUBJECT	TITLE OF FILM
1. Milk	From Cow to Consumer (Sh)
	Milk, Nature's Perfect Food (W)
	The Pantry Cow (DM)
2. Cheese	Dairying Industry (U)
	Why Eat Cottage Cheese (USDA)
	Cheese (Ar)
3. Oleomargarine	Oleomargarine (Ar)
4. Orange	Story of the Orange (Su)
5. Sugar	The Sugar Trail (GE)
6. Flour and Bread	American Ace Flour (GF)
	Hecker's Flour (4 reels) (HM)
	Our Daily Bread (GE)
7. Marketing	Cheating the Garbage Can (ANM)
	Mrs. Brown vs. H. C. of Living
8. Home Nursing	Every Woman's Problem
9. Laundry	Soap Making (K)
	Blue Monday (NN-T)
10. Home Efficiency	Square Deal for His Wife (WE)
	Making Mother's Work Easier (I)

FILMS IN DOMESTIC SCIENCE AND HOME ECONOMICS—(*Continued*)

SUBJECT	TITLE OF FILM
11. Child Welfare	Our Children (E) An Equal Chance (WF)
12. Fruit	Strawberry Raising (USDA)
13. Meat	Sheep Raising (Cut Part I) (USDA) Honor of the Little Purple Stamp (USDA)
14. Marketing	Behind the Breakfast Table (NY)

FILMS IN PHYSICAL GEOGRAPHY

SUBJECT	TITLE OF FILM
1. Evolution of a Solar System	The Eternal Question (NN-T) God Divided the Night from the Day (NN-T)
2. The Heavens, the Planets and Their Satellites	The Mystery of Space (NN-T)
3. The Earth and Moon, Moon Phases and Eclipses	Parts I and II (NN-T)
4. Time and the Seasons	Time (NN-T) Story of the Seasons (NN-T)
5. Storms and Trade Winds	Kingdom of the Storm Parts I and II (NN-T)
6. Ocean Currents	Ocean Currents (NN-T) The Gulf Stream (NN-T)
7. Polar Regions	Bottom of the World Reels I and II (NN-T)
8. Glaciers and Icebergs	Bottom of the World Reel 3 (NN-T)
9. Rivers and Waterfalls	Great Rivers (C) Great Falls (C)
10. Erosion	Ausable Chasm and Dells of the Wisconsin (C) Rivers and Tides (SVE)

FILMS IN PHYSICAL GEOGRAPHY—(*Continued*)

SUBJECT	TITLE OF FILM
11. Volcanoes	The Why of Volcano (E) The Valley of 10,000 Smokes (E)
12. Geysers	Volcanoes and Geysers (SVE) Yellowstone (NN-T)

FILMS IN UNITED STATES GEOGRAPHY

SUBJECT	TITLE OF FILM
1. New York City	New York, the Magnificent (A) America's Gateway (U)
2. Niagara	Niagara Falls (SVE)
3. Making of Books and Shoes	Making of Books Making of Shoes (KS)
4. Lumber Industry	Winter Logging in Maine (C) Spring Logging in Maine (C) Conquest of the Forest (GE)
5. Transportation	Water Transportation (C) Land Transportation (C)
6. Milk and Sugar Industries	Dairying (U) The Sugar Trail (GE)
7. Southern States	Southern States (SVE)
8. Cotton Industry	Land of Cotton (GE)
9. Mining	Mining—Iron and Steel (C)
10. National Parks I	Mt. Rainier Park (C) Glacier National Park (Pr)
11. National Parks II	Yellowstone Park—Old Faithful (Ca) Yosemite Valley (Ca)
12. Colorado	Colorado's Wealth (A) Colorada's Wonders (A)
13. Mining Industries of U. S.	Terra Cotta (TC) Oil (So) Quarrying (Ed) Pottery—The Potter's Wheel (GE)
14. Indian Life	Aboriginal Inhabitants (NN-T)

FILMS IN UNITED STATES GEOGRAPHY —(*Continued*)

SUBJECT	TITLE OF FILM
15. Irrigation	Elephant Butte Dam (NN-T)
	Making the Desert Blossom
16. California	California (U)
17. Orange Industry	Story of the Orange (Su)
18. Panama and Hawaii	Panama Canal (U)
	Hawaii (2 reels) (NN-T)
19. Alaska	Alaska (2 reels) (NN-T)
20. Philippines	Round About Manila (NN-T)
	Philippine Industries (NN-T)

In addition the following have also been used during the year by the New York Board of Education. These are copies of the film lists sent to schools at the beginning of the spring term 1922:

COURSES IN NEW YORK SCHOOLS

For Which Films are Available

DOMESTIC SCIENCE

(Seventh, Eighth and Ninth Years)

SUBJECT

Milk as a Diet
Dry Milk
Manufacture of Headcheese
Cottage Cheese—Nutrition Value
Orange Growing (3 or 1 reel)
Beet Sugar
Bread Making
Thrashing Wheat, Making Flour, Bread
Child Welfare (P.M.) (2 reels)
Child Welfare (P.M.)
Soap Manufacture (2 reels)
(Chemical combination shown in small quantities, wholesale production, distribution)
Laundry (From primitive through modern methods)

Western Potato Farm
Tuberculosis Prevention (P.M.)
N. Y. State Dept. of Foods & Markets (P.M.)
Economy in Buying (P.M.)
Economy in Cooking (P.M.)
Labor Saving Devices (P.M.)
Home Efficiency (P.M.)
Home Nursing (P.M.)
Western Strawberry Industry
Port of New York
(Need for better port facilities and port transportation)
Spaghetti
(Process of making spaghetti industrially)

NOTE: (P.M.) means suitable also for Parents' meetings. 1 reel takes about twenty minutes to show. 2 reels can be comfortably run in a forty-minute period.

CIVICS

(Ninth School Year)

NOTE: Where two reels are indicated it means a full class period of forty minutes; by having class assembled and ready very promptly, 3 reels may be shown.

1. The City's Water Supply (2 reels)
   a. Planning and bettering a city's water supply
   b. How New York City gets its water from the Catskill Aqueduct
2. Protecting the Food of the City
   Department of Markets Film—Behind the Breakfast Table
3. Disposal of City Wastes (2 reels)
   Street Cleaning Department
   a. Snow Removal
   b. Waste Disposal
4. Guarding the Health of the People (2 reels)
   Health Department
   a. Better Babies
   b. Milk Inspection
5. Public Provision for Recreation (2 reels)
   State Conservation Commission
   Animal and Forest Conservation
   Training a Forester
   Reforestation
   Forester in Action
   Fish Preserve

6. Protection of Life and Property (3 reels)
   Fire Department
   Training a Fireman
   Answering a Fire Alarm
   Fire Prevention
   Police Department (2 reels)
   Attempted Burglary
   Apprehension of Criminal
   Trial in Police Court
   Police Record
   Finger Prints
7. Public Education
   a. Typical Grammar School classes actually conducted—shop work, domestic science, assembly, etc.
   b. High School of Commerce
   c. Work with Crippled Children
   d. Open Air Classes for Cardiacs
8. Practical Citizenship—Knights of the Crossroads (2 reels)
   Produced under the direction of A. J. Balcom, Asst. Sup't. Schools, Newark, N. J. Shows how school boys cooperate with traffic squad in preventing accidents. Real scenes, not faked—splendid film.
9. Communication and Transportation (2 reels)
   The Port of New York
   (Port Authority Film)
10. City Planning
    Washington, D. C., including aeroplane view showing the city plan.
11. Making Citizens
    "The Making of America." Film showing immigration from foreign countries, where the immigrants settle, what they contribute to our national life, etc.

From the foregoing syllabi it may be seen that courses in home economics, physical and United States geography, biology and civics are being plentifully supplemented with film. In fact, the only reason why more films on these subjects and films on other subjects were not included in the syllabi is that the appropriation was too small for the purpose. Other suitable and usable films were to be had.

This does not by any means imply that these films

were ideally suited to the courses in which they were used or were pedagogically perfect or could not be improved upon. It does mean that the New York Board of Education has had the practical wisdom of making the best use possible of the best films obtainable and that it has not set its motion picture standards at an impracticable height. Since it could not, at this time, find in all cases the exact character of film needed, it was willing to take the best to be had and willing to meet the producers half way and coöperate with them to improve their product.

The films selected were gathered from the libraries of a number of producers, whose coöperation has made possible the helpful and practical film courses now being used in the New York schools. These films were selected for their teaching value from hundreds viewed by members of the Curriculum Committee. Reports of this Curriculum Committee are most encouraging. One report refers to the "increasing interest in the production and use of motion pictures for instruction" and "a favorable change in attitude of some producers toward the use of pictures in the non-theatrical field."

The films selected for use in the New York schools ably represent the three general classes of films suitable for school use,—theatrical, industrial and pedagogical. For example, Sir Ernest Shackleton's *Bottom of the World* (NN-T) was made for theatres and used in the schools in its original form. Some were re-edited from original theatrical material, such as the Burton Holmes text-film on *Alaska*; some are distinctively advertising industrial films, such as those on the manufacture of soap and shoes; others, like *How Life Begins*, Wythe's Civic pictures, *Park's Popular Science Series* and the agriculture films produced by the De-

(U. S. Department of Agriculture)

MODERN DAIRYING

partment of Agriculture were made in accordance with pedagogical principles, strictly for educational use.

About forty cities in the United States are using films today as a part of the classroom work, but New York City has been taken as an example because, though working under a smaller appropriation for visual instruction than many other cities, more systematic work seems to have been done there in the use of films directly correlated with courses of study than in any other place. The account of what any of the other thirty-nine cities has done is equally full of interest. By the time this reaches the teacher the number will perhaps be much greater. Visual education is here. Not only are hundreds of useful and helpful films available for instruction but out of the mass of good, bad and indifferent material the better films have been culled and put to work. What New York has done is an encouraging example.

No attempt has been made in this chapter to exhaust the list of films which might be used in schools. The few examples given represent only a small fraction of the total number available. The teacher desiring to obtain lists of all available material is advised to apply to the following sources:

(a) The various educational film distributors listed in the appendix.
(b) The Departments of Agriculture, Labor and Commerce, Washington, D. C.
(c) State Universities having visual instruction departments.
(d) The weekly bulletins of the National Motion Picture League, 1819 Broadway, New York City.
This league is an impartial voluntary and capable body which reviews all films before release and issues classified weekly lists of those reaching a high moral standard.
(e) The Visual Instruction Association of America, 157 East 67th Street, New York City.

(f) The National Board of Review of Motion Pictures, 70 Fifth Avenue, New York City.
This Board supplies lists of educational films of the companies whose films they review.

(g) The Educational Screen, 5 South Wabash Avenue, Chicago, Illinois.

(h) The list of "1001 Films Plus" distributed by Educational Screen and containing nearly 5,000 films, together with lists of distributors and addresses of exchanges. This will be exceedingly helpful to the teacher.

With these lists at hand the teacher, the principal or supervisor can readily see what films are available, but since new films are constantly being issued he should keep informed of the new productions through the pages of the educational film journals and the catalogues of the distributors.

IX

HOW TO USE FILMS IN TEACHING

Methods Recommended

WE have discussed the limitations and advantages of motion pictures in education, what subjects can be taught by motion pictures, where films can be used to best advantage in the school curriculum and the types of films available. Now we come to the most important problem confronting those interested in the use of films in the educational system—HOW should films be used in teaching? What are the best methods?

There are two distinct ways of arriving at a sound teaching method: (1) by experiment, and (2) by the application of well-established pedagogical principles to the problem. A careful combination of the two ways is to be the basis for the recommendations to be made in this volume. Either way unsupported by the other is apt to lead to error. In the first method the conditions of the experiment are apt to be unfair, inaccurate and not representative of situations usually present. Further, by this method, an average result from the average of pupils of the number concerned in the experiment is arrived at, a result in itself unscientific and open to inaccuracy. There is no average pupil and conditions are nowhere exactly the same. The human element is an essential element too often overlooked. The child is not a standardized machine responding to fixed rules of practice, or a chemical agent

reacting definitely; and experiments conducted by one teacher or a group of teachers on one or several groups of children, especially under experimental conditions, can not establish a rule having definite or assured application to other groups. Moreover, experiments can be so conducted that either side of a proposition can be proved equally convincingly. Experiment alone, while it may point the way, is not conclusive. Advocates of the experimental method claim that conditions can be controlled and that the resulting curves of averages are reliable. While the writers are not convinced of either premise, the results of experiments will be presented for consideration.

Under the general term "experiment" may also be grouped the results obtained by teachers in the use of motion pictures in actual, every-day school work. These results we believe more valuable than tests which, no matter how conscientiously performed, are conducted under experimental conditions. These conditions may approximate, but it is not reasonable to assume that they can duplicate, ordinary school conditions. When results of experience are checked up by tests conducted by the same teachers in the same school and in the same subject matter and with the same bodies of pupils as are the factors of "the results of experience," the evidence is many times more valuable.

The second method,—that of applying established principles, also has its limitations. The dangers latent in this method are faulty judgment in the selection of the principles, improper application of the principles to the use of the new materials, wrong premises, and faulty logic in the drawing of conclusions.

A combination of the two methods, logic borne out by experiment, while still subject to human error,

nevertheless affords opportunity of verifying the one by the other. This is the plan to be employed in this chapter. We shall apply such accepted principles to the instructional use of motion pictures as are applicable and then check up the result by the more impressive experiments which have been made and by the experiences of established schools. This, we feel, is the most efficient way to reach definite and sound conclusions on the basis of which practicable and substantial recommendations can be made.

Pedagogical Principles

Following are some of the well-established principles of teaching accepted by educators which have a definite application to the use of motion pictures in education:

1. Since education is the harmonious unfolding of all the faculties and since knowledge is received through sense impressions, the more senses utilized in conveying knowledge the better the result.
2. The pupil must be prepared in advance for the use of materials. The pupil should become familiar with his tools and know what he is going to handle before he handles it.
3. The teacher also should be fully prepared, "three times as well prepared" as the pupil.
4. Present the lesson so as to arouse interest and to stimulate to greater endeavor.
5. More material than can be well assimilated should not be given at one time. (*Multum, non multa.*)
6. Utilize materials of instruction so as to develop all the faculties of the mind.
7. Present lessons in an orderly and systematic way, so as not to cause confusion or a complex of impressions.

8. Vary the methods of teaching and the teaching materials used, in order to utilize such methods and materials as are best suited in each instance to accomplish the purpose of efficient instruction.

9. Dramatize the lesson, visualize it.

10. Repetition is an important practice in memory training. Vary the method of repetition.

11. Discussion drives home the lesson. By oral review the teacher can discover which pupils are deficient in the powers of observation.

12. Written review fixes facts in the pupils' minds.

The essential principles here set forth can be summarized in four words which every teacher, who has studied methods, knows: Preparation, Presentation, Discussion, Application, or—Hear, See, Say and Do. The child should be prepared for, or hear about, what he is to see; after seeing it he should then discuss it and then apply it. Every user of visual aids should keep these principles constantly in mind, for they have a very practical application to the use of motion pictures in education. The teacher should prepare the film lesson adequately, present it ably, discuss it intelligently, draw the children into the discussion and have them apply the lesson to every-day life.

Any teacher should be able to apply these simple rules intelligently, but additional suggestions and concrete applications and specific recommendations may prove helpful at this point.

The paragraphs below point out the application to motion pictures of the general pedagogical principles on the preceding page in paragraphs bearing the same numbers.

(1) The first principle, that the more senses which are employed the better the result, does not mean neces-

sarily that the several senses should be employed simultaneously. While some might imagine nothing more delectable than having all five senses administered to at once in a luxurious movie palace where entrancing music delights the hearing, soft comfortable upholstery administers to the sense of feeling, delicate perfume pleases the smell, the munching of chocolates tickles the palate, and a beautiful picture completes this joy ride of the senses, such a combination attempted in the classroom might result in distraction and confusion. In the one case there is a blending of sense impressions which forms a harmonious unit; in the other a discord is sounded. But if, in the school, a lesson, say on oranges or the orange industry, is first heard about, then seen in a film or other form of picture, then the subject matter is felt, then tasted and smelled, the facts of the lesson are apt to be driven home clearly and the memory of it made strong and persistent.

(2) After viewing the film or studying the film outline, the teacher should adapt it to the peculiar needs of his class and make a set of questions to be asked the pupils during the discussion. The questions should be specific and should stimulate thought on the part of the pupils.

The class should be prepared in advance for the film and told what phase of the lesson the film will illustrate, so that he may know what to look for. The value of the best of pedagogical films will be enhanced by proper preparation, and the very faults of a film can be turned to good account if the pupil is told in advance that the film is imperfect or inaccurate and if he is thereby taught to exercise his critical faculties in a constructive way.

Although Mr. J. J. Weber deduced from his experi-

ments already referred to that the use of the film first followed by the lesson is two per cent more efficient than the lesson followed by the film, the weight of authority and experience seems to point the other way. As far as we have been able to ascertain, the majority of users of visual aids have found that the lesson first followed by film is the common practice and certainly it is upheld by sounder pedagogical principles.

While in no way conclusive, it is significant that in the face of the findings, the 476 Seventh A grade pupils participating in the test, when asked which method they preferred, voted 259 for the lesson first and film afterwards to 217 for the film first. This is particularly interesting to the authors, who are convinced that according to all laws of approved pedagogy there should be proper preparation before the film showing and that the showing should be followed by discussion. Even when the film is used to give a background or furnish "atmosphere," or to put pupils in a receptive frame of mind for the lesson to follow, there should be preparation for the film on the part of both pupil and teacher. We can not emphasize this too strongly or too frequently.

(3) The teacher should, if possible, see the film in advance, in order to determine how it can best be correlated with the lesson he is teaching. If this is not possible he should study the outline, title-sheet, or, better still, the continuity-sheet, which gives both titles and brief descriptions of scenes following the titles. An increasing number of non-theatrical film producers and distributors are supplying outlines with their educational films.

(4) The principle is enunciated by no less an authority than Ernest L. Crandall that the film in school work

should never be shown as entertainment but as part of the regular work of the class. We do not construe this to mean that the film should not be given as a pleasant way of learning. We think that one of the great benefits of the films in school work is that they do make learning less of a drudgery and more pleasant and entertaining. If presented in this way more interest and enthusiasm are aroused in the work and consequently more active participation and earnest endeavor engendered in the pupil. The film lesson should be looked forward to as one of the joys of the day and a recompense for less pleasant and more irksome and burdensome parts of the school routine.

(5) During a given class period, show only films on a single theme or on related themes. Too many will confuse. Short lengths are preferable, especially for younger pupils. Impressions come so quickly in motion pictures, sixteen images a second, that the eye and the mind can, with profit, take in only a limited number of impressions in a given time. A younger child can not concentrate for long at a time and should be served his film lesson in small portions. Five hundred feet or even less, taking from five to ten minutes to show, is a good length for younger pupils and from 500 to 2,000 feet for older pupils, except in story films, which may, and usually do, run longer—five or six or eight reels.

(6) Most uses of the cinema in school work are predicated on the development of the understanding. The use of films can also serve as a valuable factor in memory training. To accomplish this the taking of notes during the showing of the film should be discouraged.

Not only will the effort used in remembering what is

seen in the film be valuable memory training, but on the other hand taking of notes defeats their purpose because the pupil will lose many things while recording one, so rapid do impressions succeed one another and because notes taken in the dark while looking at the film often cannot be read.

(7) The presentation of the film should be clear, with the best projection obtainable, and should be introduced smoothly with the least possible confusion or delay during the course of the lesson. The teacher conducting the film lesson should not attempt to run the projection machine, since this will tend to distract the attention of the class and also of the teacher. One of the pupils, trained for the work, should take entire charge of projection, if held in the classroom. All preparations should be made ahead of time, before the class convenes, so that at a given signal, the shades will be drawn down, if that be the method employed in darkening the room, and the projection of the picture started immediately without adjustment of the machine, focusing, threading of film, or other performance causing delay or distraction. All the preliminaries should have been seen to in advance, the film threaded and actually tried out on the screen to make sure it is right side up and right side towards the lens and properly focused and framed on the screen. Delays, adjustments and other causes of distraction seriously interfere with the efficacy of the film presentation.

If the picture is shown in the auditorium either one of the especially trained pupils, or another teacher or the engineer or janitor should operate, unless, of course, a man is employed specifically for the purpose.

Too much stress can not be placed upon the importance of good, clear, bright projection in a properly

darkened room, and a smooth, quick transition from the lesson to the picture.

The film should be shown without lecturing or with only an occasional remark by the teacher to emphasize a point or to keep attention active and directed. It has been a mooted point among educators as to whether or not it is better to talk while the film is being shown. To show it practically in silence is considered better pedagogy. Not only are the images coming so rapidly that it requires all of the pupils' powers of concentration to see what is passing before their eyes, but the necessity of listening to the teacher may prove an unnecessary distraction that is confusing, the result being that the pupil has a less clear idea of what the film showed or what the teacher said than if he heard and saw separately.

Mr. Rabenort is one eminent authority who differs with us in this connection. He maintains, and he has the results of experience in his school behind him, that well-directed questions asked during the film showing will direct the pupil's attention to points which he might otherwise miss and further that if the pupil expects questions he is more alert. We agree that the pupil's attention is kept alert, but rather in listening for and expecting the questions than in viewing the film. A passive attitude, we believe, is better for acquiring the greatest number of mental impressions.

In the same connection, Mr. Rabenort brings up another interesting point. Though devoting to motion pictures about one-fifth of the time spent on courses in which films are available, he desires to use still more films which are accessible to him. He is unable to devote more time to them in these courses and suggests the substitution of oral descriptions by the teacher to

replace the titles in the film, thus affording time to run more film. It is a suggestion worth weighing, particularly when it comes from an experienced and practical teacher.

(8) Stereopticon slides will serve as valuable complements to motion pictures and will introduce a pleasant variation, particularly if the slides are colored. But more important, the slide affords the better opportunity of studying the details of an object in repose. Well-colored slides of a country introduced at the end of a series of cinema landscape views are especially pleasing and impressive. If a film on Paris is shown, and the teacher desires the class to give more attention to the carvings on the doors of Notre Dame Cathedral than could be shown in the film, or to paintings in the Louvre, then slides of these subjects will give what the film can not. Slides also afford the opportunity of studying an object in color not possible with the film.

On the other hand, it is to the film and not to the slide that the teacher must look for detail in action or operation. Fifty slides, say on the harvesting of wheat, can not be shown in less than twenty minutes. In less time than that one reel of film can be shown containing, in addition to four or five minutes of explanatory titles, ten thousand or more separate views of the methods used in wheat harvesting and these in motion.

(9) Many efficient teachers carry the practice of dramatizing and visualizing lessons to a high degree of effectiveness and are able through these means to make what would otherwise be dull and prosaic intensely interesting and compelling. The film affords the means of doing this as few other devices can and fits in well with displays of actual materials, photographs, stereographs, slides, graphs, charts, visits to factories, field

trips and other means that may be employed to make a dull subject live.

If, for example, a class in civics is studying the work of the government in game conservation, a film showing birds, deer and other wild game on game preserves in the Coconino or Pisgah National Forests would be the next best thing in teaching value to going there, and in some respects even better, for it is often quite difficult to find the game when it is wanted, and camera men in order to obtain such a picture have frequently spent weeks or even months in the endeavor.

(10) Show the film twice when possible and quiz between showings. A second showing will clear up incomplete impressions and permit pupils to observe details overlooked during the first showing. It is often advisable to stop one or more times during the course of a single reel to ask questions.

Many films are available as summarizers and can be used profitably in reviews. Of their very nature they cover a broad area in a short space of time and vividly recall, through direct presentation and the association of ideas, a multitude of facts regarding their subject. The film may be shown both in the original course and again in the review, or, in the case of certain films, may be used as summarizers only. Good examples of films well suited for review are the Peters' text-films on China and India (NN-T), two reels each, which summarize the outstanding points of entire countries in twenty-five minutes. Regarding this text-film on China, Prof. Balcom, Assistant School Superintendent of Newark, said that it was the best example he knew of instructional film, since it gave in two reels, simply and logically arranged, all that a general student needed to know about the country.

(11) The film showing should be followed by class instruction. This organizes and fixes the information given in the film and offers opportunities for the socialized lesson when desired. If the film is shown in the auditorium it is best to hold the discussion also in the auditorium while the impressions are fresh.

(12) A written review the following day or later is excellent for driving home the lesson and for fixing visual images. It has been found that a second showing several weeks or a month later, followed by a written review, is an excellent practice. At the present stage of visual education this is rarely practicable. If the pupil knows he may be called upon for a written review, it has been found that his powers of observation in a single showing are strengthened and stimulated and that he is more attentive.

The methods we have set forth are necessarily of a general nature. The users of visual aids anywhere can apply these general principles to his own peculiar situations and needs. Each teacher must, with these broad principles as a guide, feel his own way and establish the finer details of his own procedure.

But let us pause here and show how a series of film lessons on different subjects and in different grades can be conducted and how individual teachers have worked out some of the problems that arise in the use of motion pictures to meet the exigencies of their own classes.

A Lesson with Films in Kindergarten

(As conducted by the writer before a class of primary teachers studying methods)

The subject of the film was *Hey, Diddle, Diddle,* one of the *Magic Pen of Mother Goose* series, an ani-

mated drawing, in which a magic pen appears on the screen and draws the familiar figures in the old nursery rhyme, which appear to come to life and perform the wonders related in this child classic. The film was run off for the teachers the day before it was to be shown to the children. The teachers observed it carefully with a view to giving a brief summary to the children before the picture is shown to them, and prepared the following list of questions to ask after the film showing:

(1) Did you ever see a cow? Describe it.
(2) What does the cow do for you?
(3) Why ought children to drink milk?
(4) Do you like dogs? Why?
(5) Are cats as useful as dogs? Why?
(6) Is the moon always round? Why?

Another group of kindergarten teachers might make out an entirely different set of questions, but this list is given because it was actually used in a special film demonstration lesson and shows how application can be made to the every-day life of the child and how even kindergarten children can by means of the film be stimulated to think.

The following day the film was shown in the classroom to about forty kindergarten and first-grade children. It was the first film showing for this class, and the children were as interested in the portable projector as in the picture itself. The teacher therefore arranged to show the film twice. She explained the picture in advance, telling the pupils to notice carefully what the magic pen drew, as later she would ask them to draw what they had seen. While the film was being rewound for the second showing the children were sent to their seats and allowed to draw for five minutes. After the

second showing of the film the questions listed above were asked. The answers elicited showed a surprising amount of thought on the part of the pupils. Not only did the little ones prove most responsive to questions asked, but observed and remarked upon many features not covered by the queries. They recognized the characters when only partly drawn, they were surprised at the dog, the cow, the cat, the dish and the spoon coming to life and were most impressed by the action suiting itself to the words of the rhyme, the climax coming when they saw the cow jump over the moon. The picture undoubtedly left a new impression—a visualization of the words, which, before viewing the film, were little more than words.

This lesson given for a kindergarten class, with a large observation class of primary teachers, was voted a decided success both by the class of teachers studying methods and by the children.

A first-grade teacher who has used films in the lower grades, said:

> I've been amazed at the direct help movies have given us. Nature and fairy story films helped most. They have brought us the illustrative material we need and are a wonderful help in observation.

Teaching Biology with Films

Now let us take a biology film suitable for the seventh or eighth grade. The subject of the film is, we'll say, *The Life History of the Monarch Butterfly* (SVE). The class has been studying the subject. They know what the larva is, the pupa stage, the chrysalis. The film, in this instance, is to be used as a review. The teacher announces that a written review is to be given on the subject and that a motion picture which will show them phases of development they have been un-

able to see for themselves will be filmed in the auditorium. The day before the written review, all of the seventh-grade biology pupils are taken to the auditorium to view the film.

The teacher who is conducting the film lesson gives a brief history of the work in biology studied by the class up to that point and tells what points the film will touch upon. The teacher has been unable to view the film in advance in this instance but has studied the outline and list of titles. She views the film, which is shown in silence, as intently as the pupils because she will make out the questions that evening for the written review on the morrow, and the questions are to be based on both the film and the textbook.

The teacher makes mental note of the points she hopes the film will emphasize and watches carefully to see if it fulfills her expectations. She wishes to learn if the pupils saw in the film what she saw and so makes this a socialized lesson. The discussion is led by the pupils instead of the teacher. They bring out points she did not see. There is a question in dispute and in order to settle it the teacher arranges to have the film run again up through the disputed scene. The time being up, the teacher announces a written review for the following day. She carefully makes out the quiz questions before leaving school. The next day a brief ten-minute discussion of the film lesson is conducted prior to the written review, which consumes the remainder of the study period.

Teaching Nature Study with Films

At the present stage of film production it is often necessary to adapt available films to the classroom work. Here is an example in point:

A grammar school has arranged, through the Extension Department of the State University, to secure a series of Department of Agriculture films. The first film on the list is *The Wichita National Forest and Game Preserve* in two reels, described in Department of Agriculture Circular 233, as follows:

> Witchery of the Wichita; weird rock formations and scenic wonders of this little-known Forest; birds, bison and an Indian buffalo hunt; wild turkey and deer.

This description is sent by the principal to all grammar-grade teachers, who are invited to remain after school for a half hour to witness the showing with a view to using the film in their classes. The majority of the teachers remain. The film sounds as if it had educational possibilities and would be entertaining. It proves to be both.

One of the grade teachers decides that she can use it to advantage as a Nature Study subject and makes out the following questions to ask her class:

1. There were six birds shown in the film. How many can you name?
2. How many have you seen in this section?
3. What do birds do for man?
4. How can you attract them to your home? What means did the Forest Ranger's wife use to attract them?
5. How many animals did you see in the Wichita National Forest? Name them.
6. Why does the U. S. Government protect wild game and birds?
7. What is a bison? Describe it.
8. What is the difference between deer and elk?
9. In what parts of the United States are deer still to be found?
10. Have you ever visited a government preserve?

Another teacher decides to use the same film as the basis for a geography lesson on Oklahoma and the

Southwest, another uses it for a civic lesson, each making out his own list of questions to be used in the discussion and application of the film to the lesson and to every-day life.

Since the film is to be shown to the pupils of several grades it is decided to project it in the auditorium during the study period.

Each teacher prepares his class for the film in his own classroom on the day before the showing. In one room a talk on National Forests, with maps of the 181 National Forests in the United States, is made. In another, a lecture on forestry and forest preservation is given. A lesson on birds and bird protection is held in another grade. Elementary geology and different rock formations form the preliminary preparation for the film showing in still another classroom. In order adequately to prepare the pupils for such a film the teachers find that preparation on their own part is necessary. Film lessons usually mean more rather than less work for the teacher, but the film usually arouses the interest of teacher as well as pupil and their desire to learn more about the subject of the film. The teachers, at an after-school film-showing, discuss their plans and decide on a fifteen minutes' general discussion in the auditorium following the showing. A general discussion on civics, nature study, forestry and geography, with a written review on the specialized subject, is held in their respective classrooms the following day.

The film is shown, as planned, to a large group of students previously prepared. One teacher keeps order while another conducts the general discussion. The one film has been made to serve a variety of purposes. Though not made primarily for classroom work and

not correlated with any textbook, the Wichita film was made by the United States government to teach a lesson, and was applied by skillful teachers to teach lessons on civics, geography, conservation and nature study, with excellent results.

A Civics Lesson

Films prepared especially for the purpose of teaching civics have been used successfully in various schools of the country. The Wythe Civics series (Wy) in thirty lessons is an excellent example of the pedagogical film prepared for specific classes and grades. Accompanying the films is a teacher's manual giving the lesson story, lesson plan, problem questions, project work and book reference for teacher and pupils. These outlines have contributed largely to the success of the lesson. They are so thorough and complete and have proved so helpful to teachers that a specimen copy is given here in its entirety, to show teachers who are planning to use these or similar films what can be done with a film lesson.

CITIZENSHIP AT SCHOOL

Lesson 9—School Industries

Two boys, John and Frank, aged six years, lived in the same city. Physically and mentally they were very much alike. John was led to understand that he was a part of the home circle and must enter into its responsibilities as well as enjoy its privileges. In diverse ways, he did his share, small as it was, to help in meeting the duties of home-making. With Frank it was different. Participating in the privileges of the home and not assuming any of the responsibilities, he came to take it for granted that father would produce the next meal, the next movie ticket, the next ice cream cone. If these were not forthcoming, Frank was out of patience. A request to build the fire or to work in the garden offended him.

On entering the kindergarten both boys were shunted out of

the field of production. In preparation for world activities they hurried along from kindergarten to elementary school, to high school, and through the university.

Unfortunately, there was no place in the educational program for productive education. The state seemed but little concerned to create a respect in the minds of the children for, or to establish the habit of, industry.

Despite the wide educational indifference to the increasing number of non-producers the steadying influence of John's home training kept him in the field of industry. He capitalized his school training. He made it productive both at home and in the neighborhood.

Both boys graduated from the university, each prepared, supposedly, to take part in productive activities. Unfortunately, Frank, scholastically trained for commercial life, had not established the habit of work. Charged with a first-rate opinion of his power, he sought long for the position which he thought the business world owed him. Finally, forced to work, he drifted from position to position, becoming a dissatisfied, dangerous non-producer. John, on the other hand, having capitalized his training at odd hours during the session of the school and at vacation time, on graduation merged into the business world, an efficient worker at the start.

Thus it is that 40,000,000 Johns have come to do the work for and furnish the necessities of life for 60,000,000 Franks. In other words, in this country 40,000,000 producers are doing the work for 60,000,000 consumers. Numbered among this great body of consumers are 20,000,000 boys and girls. They consume at least one-seventh of the foodstuff of the land and produce but little. This great army is marching onward to fill our places in Congress, in the schools, in the churches, in business. To what extent the generation is improved will depend upon our children's habits of thinking and acting.

Ten million boys and girls of this army of consumers are physically and mentally able and very willing to produce a part of that which they use and consume. Certainly the nation should formulate a program to set our boys and girls to work making effective their school training and capitalizing their enthusiasm, energy and powers for production.

The Lesson Plan

Civic Content:

1. Production at school.
   a. The garden.

b. The manual training and domestic science departments
c. Miscellaneous efforts.

2. Use of products for profit, convenience and pleasure.
a. The cafeteria.
b. Products of manual training and domestic science work for school and home use.
c. Results from practical application of other departments.

3. Suggestive methods for teachers.
a. Education through doing what the child desires to do. Developing inherent interests.
b. An outlet for school industries. Motivation of school industries.
c. Organization of children's spare time for productive industry.

General Topic Aim: To establish habits of industry, of production; to teach that production is a first step in good citizenship, each child should produce a part of that which she or he consumes; to train the hand, the eye, the brain through doing.

Specific Lesson Aim: To motivate school industries; to set the children to work.

Motivation: Physical characteristics: (1) Boys and girls at work; (2) concrete projects involving activity.

Lesson Psychology: (1) Appeal to the creative and social instincts; (2) exercise of play spirit; (3) imitation of adults.

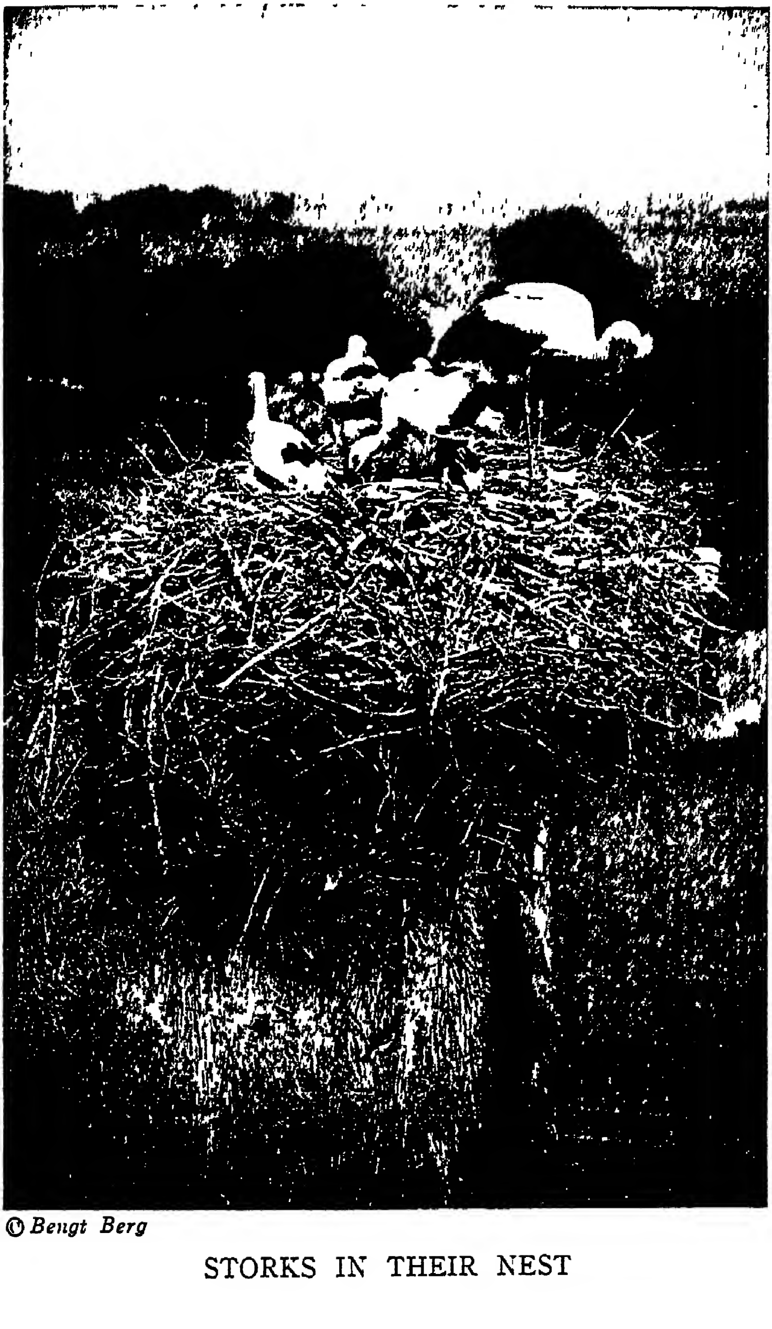
Teacher's Preparation: (1) Familiarity with the lesson story and synchronized paragraphs; (2) acquaintance with the film; (3) mastery of civic content.

The Lesson Story

It is lunch hour. Several boys and girls are sitting on benches near the schoolhouse eating their lunches. The principal joins them.

Concerned about the cold, hastily-eaten lunches, he asks the children if anything can be done to serve warm foods at school. A bright boy suggests that a portion of the output of the school garden be used. Whereupon the girls volunteer eagerly to prepare the vegetables and other foodstuffs.

Encouraged by the quick response of the children, the principal leads the way to a vacant room and suggests that the boys and girls install a cafeteria. Accepting the opportunity to give definite practical direction to the industrial and productive phases of the school work the principal leads the children to organize their manual training, gardening and



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STORKS IN THEIR NEST

domestic science work around the cafeteria. These types of school activities become means to an end rather than an end in themselves. They borrow interest from the creative cafeteria project.

Under careful supervision the plan quickly develops. The equipment for the cafeteria, from benches to curtains, is the work of the boys and girls. Before the first meal is served, the children, in pride, survey the completed project. The whole school is on the *qui vive* for the formal opening.

The menu for the opening day and the remainder of the week is carefully worked out by the domestic science classes. With a teacher in charge the first meal is prepared. Louise weeps as she peels the onions. With pots simmering and the fireless cookers steaming, the door is opened to a hungry, anticipating line of boys and girls.

Filing past the appealing foodstuffs and selecting those which their fancy pleases to dictate, the line breaks into sociable groups which gather around the tables.

We leave this happy gathering of boys and girls proud of their achievement, enjoying the fruits of their efforts.

The Lessons

1. *Method of approach.* Look about the room; where did the glass, lumber, bricks, etc., come from? Discuss the production of shoes, neckties, suits, dresses, etc., worn by the children. Who does the work of the world? What are the children doing to produce a part of that which they consume, wear, or use? Why should not each child, physically and mentally able, produce a part of that which he consumes? Why should father and mother shoulder all the family responsibilities? What is the school doing to pay its way?

2. *Show the film.* Discussion should not parallel film action. Anything that distracts the attention of the children from the film will tend to defeat its main purpose, that of motivation. Aural and visual senses acting together hinder each other.

3. *At the close* of the film the minds of the children will be alert, awakened. Have the film story reproduced to insure proper interpretation of the important scenes.

4. *Due to inaccurate* observation, a second showing of the film may be necessary.

5. *Set the minds* of the children at work mining out the civic content of the lesson through probing questions. When a principle is extracted, apply it to the civic life of the children at school, at home, and in the community.

6. *Devise a method* whereby the classroom impulses will direct conduct. In other words, we suggest that the children start some form of productive work both at school and at home. The resultants of such enterprise might well be used to help to relieve the economic stress, both in the homes and the school. A determined effort to "incorporate" the school as a business institution, to capitalize and to give a practical outlet to school training, would measure high in educational and civic returns. A surplus left after serving the homes and the schools could be marketed to the general public. Individuals could be encouraged to follow the lead of special interests in industry and later to establish a market for their products. The most nearly satisfied worker is the one who has commercialized a hobby.

CONCRETE SUGGESTIONS:

Art Department. Paint and crayon sketches for home and school use. Creation of market (1) for sketches of Mother Goose rhymes done in water colors for nurseries; (2) for leather and cardboard novelties; (3) for such a novelty as artificial flies used in trout fishing.

Manual Training Department. Furniture and fixtures for the home and the school. Establishment of market for surplus school and home products. Interest the children in the creation of simple novelties which may be marketed readily.

Science Department. Establish simple industries such as the making of lens, kites, etc.; organize small business groups to serve the patrons of the school—spray shrubs and trees, attack the ant problem.

Agricultural Department. Production of foodstuffs at home and at school for home and school purposes. Production at home of young fruit trees, roses, sweet peas, etc.; raising of high-grade poultry, rabbits, and the like. Creation of market for surplus products.

Domestic Science Department. Cookeries for home and school use with establishment of market for the surplus. Individuals to develop a market among friends for special dainties.

We do not wish to urge commercialization of our children but we do think it very desirable that the boys and girls shall establish the habit of work by helping a little every day to do the work of the world.

LESSON QUESTIONS

1. What concerned the principal as he noted the pupils eating their lunches?

2. What did the pupils think about the suggestion for warm lunches?
3. What did the girls volunteer to do?
4. Is there a vacant area in your school where a cafeteria might be established?
5. How did the boys and girls busy themselves in the project?
6. What was done with the vegetables?
7. What is a fireless cooker?

Problem Questions

1. Discuss the value of home and school gardens.
2. What is to be gained by eating warm lunches?
3. Where is the most sanitary location for public eating places?
4. What is an "economy menu"? What must be borne in mind in making one?
5. What are the advantages of a fireless cooker?
6. What is gained by the cafeteria method of serving meals?
7. What is meant by the statement, "Prices are governed largely by the supply and the demand"?
8. In 1920 sugar was 27½ cents a pound. In 1921 it sold for 6½ cents a pound. How would you account for the difference in price?
9. Define economics, capital as used in business life, unionism, corporations, partnership, socialism.
10. What do you think of government ownership of public utilities?
11. How do you account for the strife between capital and labor?
12. What is being done in the state to protect the worker?

Projects

1. Plan an economy menu for one week for your home. For a school cafeteria.
2. Bring in plans and suggestions for making a fireless cooker, or better, make one.
3. Give somewhat in detail a plan for a cafeteria, including arrangement and management.
4. Visit industrial plants.
5. Make a comparative price list of foodstuffs a year ago and now. How do you account for the change?
6. Compare wages paid a year ago and now. How do you account for any difference which may exist?

7. Make a list of industrial activities which might be undertaken by the school. By individuals.

8. Organize business groups in the school to undertake industrial activities such as destruction of household pests, care of shrubs and trees, etc.

Suggestions for the Week

First Day. Use of film lesson and discussion.

Second Day. Discussion of subject matter in the class text. Assignment of problem questions and project work.

Third Day. Library or study day.

Fourth and Fifth Days. Field trips and discussion of assignments.

Pupil's Reading

The Child's Food Garden........................*Kilpatrick*
World Book Co., Yonkers, N. Y.

Robinson Crusoe ....*Defoe*

The Story of Foods......................*Forrest Crissey*

Garden Steps ....*Ernest Cobb*

Life of Luther Burbank

How We Are Fed....................*Jas. F. Chamberlain*

United States Food Leaflets

The Principles of Agriculture............*C. A Stebbins*
Macmillan Co.

Household Arts for Home and School..*Cooley and Spohr*
Macmillan Co.

Text References

Community Civics......................*Ames and Eldred*
Macmillan Co. Chap. 1, P. 22.

Community Civics.................. ..*Field and Nearing*
Macmillan Co Chap. 21, P. 236.

An Elementary Civics........................*McCarthy*
Swan & McMullin. Chap. 10, Pp. 92-3. Chap. 11, Pp. 126 and 129.

The New Civics...................................*Ashley*
Macmillan Co. Chap. 3, Pp. 38-39. Chap. 15, Pp. 302, 304, 306. Chap. 19, Pp. 379.

Some splendid results from the citizenship film series have been noted in the Los Angeles schools where they

were used for seventh-grade work throughout the school system. Each lesson is built around an interesting story involving the personalities of a boy and a girl of the same age as the children for whom the lessons are intended.

A Health Lesson

"A satisfying project was worked out in the foreign district with the lesson—Physical and Mental Fitness," writes a member of the Los Angeles Visual Education Department:

> The picture is full of action and when Emile, the class representative who failed at the try-outs through his own negligence, is given an opportunity to make good and wins the race for his school, the children reach the highest point of enthusiasm. A discussion of the beneficial effects of health habits followed the picture and as a result the class voted to keep health score cards for a month as Emile and Louise did in the picture. But one of the best reactions came from the principal of a school located in a foreign district. She stated that although the lessons were given in the seventh grade only, their effect had carried through the entire school. Four months had elapsed and the children were still living up to the ideals gained during the citizenship film lessons.

An Entomology Lesson

Few realize the work that has been done by producers of educational films to aid the teacher in the use of the films. "Teachers' Aids," for example, have been issued by the Educational Department of Pathé. This contains a list of the titles, additional information, suggested questions and problems and references. A Teacher's Aid on the film *Ants: Nature's Craftsmen,* reads as follows:

APPLICATION

NATURE STUDY—ZOOLOGY—ENTOMOLOGY

THE TITLES (as they actually appear on the screen):

1. ANTS: NATURE'S CRAFTSMEN.

2. From the Series of Fascinating Nature Studies on Wonders of Life in the

3. Plant and Animal World.

4. Ants present a most interesting and extensive study because, next to man himself, the wonder of their seeming intelligence is not surpassed in the Animal Kingdom. Even *Man* could well take some lessons from them about Community Life.

5. Although there are about *5,000 kinds* of ants they all include the three usually well-distinguished types of individuals:

Queens, Males or Drones, and Workers

6. First, may we meet the "lady of the house," the *Queen,* who is sometimes responsible for starting, alone, the whole colony.

7. Yes, those are *wings* that you see. Both the male and queen have them for their mating flight.

8. After the flight, as soon as the Queens are to become mothers, their wings are shed, many times by the assistance of the other ants, the workers.

9. A closer view, with the wings off. The males, which we do not see here, go out of existence shortly after the flight or "Wedding Trip."

10. *The worker* or neutral. These are the ones that do all the real work. Technically they are females by construction.

11. Nothing is of greater value to her than the feelers or antennæ, with which she examines and recognizes all objects.

12. Her sole tools are her jaws and feet. Notice the two strong shears.

13. Watch this one make her toilette. They are exceptionally clean.

14. The kind of ants we are studying here live in "houses" or *mounds* like this. This one is composed mostly of bark, twigs, and some soil and grasses.

15. Although some mounds are large above ground, the main dwelling place is underneath. Here we find chambers and galleries arranged in irregular stories one above another.

16. They may look like a crazed crowd to us but these marvels of industry perform their remarkable feats of engineering with order and perseverance.

17. In order to do this, how do they "talk" when they don't even make a sound? Watch them *communicate* with their feelers.

18. In proportion to its size, the ant is ten times stronger

than man. It drags a match which for us would correspond to a log.

19. After the Queen has laid the eggs, the next important stage of development is the *larva.* We find these down in the center of the nest. Watch us dig for them.

20. Here we see these little live black creatures in their natural size, showing how greatly the other scenes are magnified.

21. Now, a "close-up," greatly magnified, showing different stages of development. These are naked *pupae.*

22. They are enclosed in these silky envelopes called cocoons, made by themselves. Inside takes place the transformation into adult ants.

23. The workers take care of these *cocoons,* containing the pupae, by moving them around to spots of a warmer temperature. Watch how they handle these bundles, larger than themselves.

24. The result of patient careful handling, signs of life. Note the one on the right.

25. Their greatest work is to bring life to the future generation. Now comes the marvellous step of the workers, feeling and knowing the time of hatching, and aiding in tearing open the cocoons.

26. The young ants, fully grown, come into the world.

27. The care of the new ants by the workers does not cease with their emergence from the cocoon. The *Nurses* feed them, the pre-digested food passing from the mouth of the feeder to that of the *new adult ant.*

28. Not only this, but the workers also groom them.

29. Ants eat both animal and vegetable food. There is hardly a production in the floral kingdom that does not yield some product to these busy, hungry searchers. They go by *caravans* to seek the sap of trees.

30. They are fired by as fierce and high a passion for the hunting of live game as ever inspired human followers of the chase.

A good capture—the *caterpillar* is the victim.

31. After the manner of human cannibals they feed upon their vanquished foes.

32. The *fly* above, to the left, is carefully watched.

33. One ant pulls its trunk, another one its leg; the workers, which have no grip on the victim, harness themselves to their sisters to aid them in their efforts.

34. Here is an example of individual *defense.* Queen visits

Queen, but the visitor is told she does not belong to this Kingdom.

35. Not only are ants wonderful workers but the greatest students of them tell us that they are really fond of what we can tell by no better name than athletics and *play*. Watch this clever gymnastic performer.

36. Ants have great courage. Even if attacked by terrific odds, they are on the job ready for defense.

37. When marauded by these two human hands, we find great excitement. The surface fairly buzzes. Their whole attitude unmistakably says, "Our Home has been attacked! Rally to defense!"

Additional Information:

Ants may not be considered of a very deep economic importance. But they are of some benefit in (1) their power to hasten the decomposition of organic substance. They dispose of a tremendous quantity of dead insect and animal matter. (2) In some cases they destroy other insect pests of plantation. (3) Their cocoons are used for bird food. Negatively speaking, there are many cases where they themselves are great house pests, as most housekeepers know. But why is it that these tiny creatures have warranted the most careful and searching study of scientists? It is mainly on account of the phases of their life that are developed around their behavior as social animals. It is here that appear most clearly and fully the habits which have drawn to these insects from the earliest ages the attention of man, and has won for them a high reputation for wisdom. Through this film will be seen the marvellous wonders of these little insects as they are worked out through: the establishment of their homes; procurement of a livelihood; protection from enemies; preservation and nurture of the young and other communal dependents; perpetuation of the species; the promotion of Community Life.

Many books could be, and are for that matter, written about these interesting creatures, but in this very limited space are simply added a few of the high spots of interest, besides those touched on in the film itself. Regarding their *mounds* and *homes:* The cones are thoroughly honeycombed with tunnels and rooms, streets and galleries, which are the actual living quarters of the commune, and form, each mound in itself, a densely populated city. This one mound that we see in this picture with several similar ones directly around it

make up a "city" that would probably surpass in numbers of inhabitants the whole tremendous population of China.

Regarding Individuals and Structure. Although there is more often only one Queen in a colony there are some species and colonies where there have been found all the way from one to thirty Queens. The antennæ of the ants probably surpass in sensibility anything at the command of higher animals, or even man. Their removal produces a disturbance in the ant's intelligence. It can no longer find its way or recognize objects. Regarding their *work:* There seems to be no trace in any quarter or in any act of a chief engineer or local foreman, or "gang-boss," or of any feasible organized directing body or official supervisor or regulator or prompter. On the surface (as far as human intelligence discerns) it is a "go-as-you-please" arrangement which nevertheless is dominated by some occult principle that brings orderly results out of seeming chaos. Regarding *Metamorphosis*. May we once for all get perfectly straight and clear in our minds the four well-marked periods through which ants and other insects such as Bees, Wasps, Moths, Butterflies, etc., pass. First, that of the egg, laid by the mother. Second, the larva (caterpillar or worm). Third, pupa or chrysalis (many times contained in the cocoon as in the case of some ants). Fourth, the perfect full-grown adult insect. Regarding their *relation to other insects, and plants:* Some other insects, especially beetles, live at times in nests of ants—these are sometimes advantageous as scavengers. Ants have many enemies. They themselves and still more their young are a favorite food of many animals. They are attacked also by numerous parasites. Bees and wasps, the two insects most similar to ants in community life, and some other insects, repay the floral kingdom which gives them food, by helping to distribute the pollen. But it is very much doubted if ants can be credited with such reciprocation.

Out of the billions and trillions of ants that exist in this world, if one loses his life, it is not much in the vastness of nature and is easily replaced. But it is an atom in the world's order that no human power can restore.

Suggested Questions and Problems

1. Why are ants important and interesting?

2. What do we mean by "social animals"? What other insects are especially like ants in this respect? Give other examples of community life, outside of the insect world. Contrast these with "solitary animals."

3. In what ways do ants resemble men? In what ways can they give men pointers about work or community life?

4. Discuss the structure of ants and their homes. What three main types of individuals? What organ of her body is probably of greater use than any other? Why? What are mounds or ant-hills made of?

5. Talk over all the different kinds of work of the ant—what divisions of labor?

6. Describe in detail the distinct stages of the metamorphosis. What do ants feed on?

References

Ants, Their Structure, Development and Behavior—By Wm. M. Wheeler—Columbia University Press, N. Y.

Ants, Bees and Wasps—By Sir John Lubbock—International Sci. Ser.—Appleton & Co., N. Y.

Nature's Craftsmen: Popular Studies of Ants and other Insects—By H. McCook, Harper & Bro., N. Y. and London.

Economic Zoology—By Kellogg and Doane—Published by Henry Holt & Co.

Practical Zoology—By Hegner—Published by Macmillan.

Zoology, Descriptive and Practical—By Colton—Published by Heath & Co.

A Text Book in General Zoology—By Linville & Kelley—Published by Ginn & Co.

The "text-films" issued by National Non-Theatrical Motion Pictures, Inc., are designed to be in themselves complete treatises on their subjects and to fit so closely into the standardized courses of study as not to need the accompaniment of extraneous descriptive matter. In addition to pictures, they contain animated maps where-ever needed or appropriate. Following, as a sample, is a list of titles of a typical text-film, that on Alaska:

1. ALASKA

2. Alaska is a territory of the United States. It occupies the northwest corner of the North American continent and is separated from "The States" by a portion of British Columbia.

3. (General map of North America with pointer pointing to Alaska, followed by a map of Alaska.)

4. *Physical character.*

5. Its land area is nearly 6,000,000 square miles, one-sixth that of the United States proper.

6. Alaska can not be reached from the United States entirely by rail, so we approach by water from Seattle, Washington . . .

7. . . . and take an inland water course toward southeastern Alaska, through Wrangel Narrows.

8. Alaska is very mountainous. The Alaskan Range extends from the Cascade Mountains . . .

9. . . . across southern Alaska to the Aleutian Islands, a chain of about 150 half-submerged mountains reaching almost to Siberia.

10. (Map of Alaska, showing southern Alaska, the Aleutian Islands and the Siberian coast, all indicated by pointer which also indicates the Siberian coast, the Arctic Circle and Mt. McKinley.)

11. Mt. McKinley, the highest peak in North America—20,464 feet high, lies in the Alaskan Range.

12. The mountainous regions around the Canadian boundary of the main portion of Alaska are drained by the mighty Yukon River and its tributaries.

13. The half of Alaska north of the Yukon is a treeless plain, swampy near the coast, except near the mouth of the river, where it is mountainous.

14. The climate is cold in winter and reaches a temperature as low as 50° below zero.

15. The summer climate is pleasant and fruitful, especially in the southern portions.

16. In the Arctic Circle the summer days are long. This picture on the Yukon was taken at 10 P.M.

17. This is a land of glaciers. We are now approaching the great Taku Glacier.

18. The mighty ice wall of Taku Glacier extends 200 feet above the water and many hundred feet below.

19. Icebergs born of Taku Glacier.

20. *History and Political Geography.*

21. The aboriginal inhabitants are Eskimos in the north and Athabascan Indians elsewhere. Many native Indian children are now in American schools.

22. The totems, to be found throughout southern Alaska, are the heraldic family-trees of the natives.

23. These old Russian cannon and the old Russian Trading Post at Sitka are relics of Alaska's first white owners.

24. An old church of the state religion of old Russia, the Greek Orthodox faith.

25. In 1867 the United States purchased the territory from Russia for $7,200,000, and the Stars and Stripes have floated there ever since.

26. Sitka was the old Russian capital.

27. Old Juneau is the new capital.

28. The population of the entire territory is about 65,000 and the towns are small. Important among them are Skagway . . .

29. . . . Haines—where Fort William Seward is located . . .

30. . . . and Fairbanks, the metropolis of the interior.

31. The discovery of gold in 1885 to 1889 brought thousands of prospectors who built large cities, now deserted.

32. Ruins of White Pass City—once a camp of 30,000 gold seekers.

33. The stampede trail up Dead Horse Gulch. The V in the sky line is the famous White Pass, just above Skagway, through which so many prospectors came in the early days.

34. *Natural Resources and Industries.*

35. Mineral and metal deposits are extensive and rich. Coal and gold mining are the principal industries. Most of the gold is now obtained by hydraulic mining.

36. Alaska ranks second in gold production among the States and territories of the Nation.

37. This huge stamp mill is near Juneau, where some of the richest gold mines in the world are found. Rich coal deposits await future railroad development.

38. Vast forests of valuable timber lie in the southern portion.

39. Salmon fishing has long been an important native industry.

40. The primitive salmon wheel of the Indian has been replaced by great modern traps.

41. Many parts of the coast are thickly inhabited by fur-bearing seal, now under government protection.

42. Whaling is an old-time industry, and whaling vessels are still to be seen in port.

43. The harpoon gun.

44. Fur-bearing animals — such as the fox — which were formerly hunted, are now also raised on ranches.

45. Though the growing season for plant life is short, the soil in the southern half is fertile and its products profitable and of rapid growth, because of the long days and the surface irrigation from the thawing ground.

46. The largest and most luscious berries in the world are raised near Haines.
47. Alaska possesses practically unlimited water power, an invaluable asset for her future commercial growth.
48. Improved transportation facilities have already started Alaska on the way to commercial wealth.
49. The Lynn Canal is a much used thoroughfare.
50. And vessels ply regularly along 2,000 miles of the Yukon through the heart of Alaska.
51. Railroads are being built.
52. Wonderful engineering has conquered a wilderness.
53. But we can never forget that the dogs which pulled the sleds over the frozen snows played as great a part in Alaska's early civilization as did men.
54. These "Huskies" are still essential to travel.
55. Our Alaskan trip ends at the boundary between Alaska and Canada, where we behold two friendly flags.

The Pathéscope Company of America, Inc., which distributes "safety standard" films, has issued a very full descriptive classified catalogue of their educational pictures, with numerous cross references. In addition to descriptions of the films the catalogue contains a list of titles and in some instances "elaborations" or descriptions of some of the scenes following the titles. Such a catalogue enables the teacher to study the film carefully in advance of its use. Here is a sample page:

COTTON—ITS MANUFACTURE

The antiquity of the cotton industry has proved unfathomable, but it is thought that the cotton industry was imported into Europe in the tenth or eleventh century, and by the middle of the thirteenth century we find it flourishing in Spain. In the new world it would seem to have originated with the discovery of America, as the wearing apparel in use included cotton fabrics. The growing, handling and transportation of cotton and the manufacture of cotton goods ranks as one of the world's greatest industries, furnishing a livelihood for more than a million people, whose wages total about $500,000,000 a year. There is an annual production of over twenty-five million 500-lb. bales of cotton, and in the United States alone some thirty-five million spindles are turning in

cotton mills, the value of the manufactured products amounting to $1,877,919,000 in 1920. Annual crop in Latin America, 385,000,000 lbs. Mexico, 200,000 500-lb. bales. Virgin Islands, United States, produced 778,000 lbs. of Sea Island cotton in 1913.

MANUFACTURE OF COTTON CLOTH

Title 1—Cotton, From Seed to Wearer.
Title 2—Panoramic view of the plant of the Amoskeag Mfg. Company at Manchester, New Hampshire, U. S. A.
Title 3—Fifty-three main buildings containing 143 acres of floor space.
Title 4—Beginning the process of making cotton into cloth. Breaking the cotton bales and feeding into machines called "openers."
Title 5—64,600,000 pounds of cotton are consumed each year.
Title 6—Cotton coming out of "openers" into belt conveyor.
Title 7—Cotton entering suction pipe on the way to dye house.
Title 8—1,500 ft. suction pipe and bridge containing same.
Title 9—Cotton arrives at the dye house. Ready for bleaching or dyeing.
Title 10—Vacuum bleaching and dyeing machines in operation. 1,200 pounds of cotton are bleached or dyed in each vat.
Title 11—Lowering the 2,000 lb. steel cover.
Title 12—The pumps which force the bleaching or dyeing liquor through the cotton.
Title 13—Centrifugal extractors removing moisture from cotton which has just come from bleachery or dyeing machines.
Title 14—Water, expelled by centrifugal force, runs out at bottom of machine.
Title 15—Suction pipe taking cotton to dryer.
Title 16—Cotton arriving at dryer.

Through the use of "teachers' aids" now being issued with educational films, it is possible for every teacher to study his films in advance. If the distributing firm issues no teaching suggestions with its films, it will usually furnish lists of titles on request and every supervisor of visual instruction, principal or teacher who is planning to use a film as part of classroom instruction should have such a list of titles. He can then prepare his own film lesson far more ably than any

outsider, unfamiliar with local conditions. The suggestions, however, for conducting film lessons as given in the foregoing pages are excellent and worthy of study.

The teacher about to introduce the use of films should ascertain from the principal or supervisor of visual instruction what films suitable for his class are obtainable or make an independent study of the film field and secure the films he thinks he can use to best advantage. After he studies the film itself he will know whether it will serve his purpose best as a preparation for the lesson or project, or should be incorporated in the lesson itself at a certain point or whether it will serve best for review.

No set rule can be laid down in this regard. The method of use depends on the film, the teacher and the class. Sometimes one method is best, sometimes another. It has been found that two different teachers using the same film in the same grade will get splendid reactions in the one case and poor reactions in the other. Again the identical method may be employed with two entirely different films with varying results. Each teacher must adapt to his own use the general methods here set forth. The personality and ability of the teacher are able to enhance the value of the film an hundred fold by the manner of its presentation.

A Few Don'ts

In conclusion, we wish to emphasize another point, namely: It is better not to use films at all in education than to misuse them. Here are a few don'ts that may help the prospective user:

Don't use films just to pass away the time, or because a film is available.

Don't use films to arouse interest, then neglect to take advantage of the interest aroused.

Don't use films unless they have some bearing on the subject studied and don't fail to apply the film to the particular lesson or project.

Don't use films because you think it may save the teacher a lot of time and thought and work. Films, if properly used, will mean more, rather than less, work for the teacher until he knows his film material and finds the best way to adapt it to his special problems.

Don't use films under any circumstances without some preparation. A poor film lesson is worse than a lesson without films.

X

SOME SUCCESSFULLY APPLIED METHODS

It will be interesting and helpful to learn something of the methods actually employed in school systems where visual instruction, through the use of films, is being successfully applied.

In New York Schools

Although several school systems have employed motion pictures for instruction for a longer time, the Board of Education of New York City has probably gone further than any other school system in the country in the utilization of films as a definite part of the curriculum. The work is handled under the supervision of a director of visual instruction and an assistant who furnish both slides and films to the schools equipped to use them. Up to the time of this writing, about seventy-five of the seven hundred schools in Greater New York have standard-width projectors and about two hundred of the safety standard machine. The seventh and eighth grades are up to this time the only groups being supplied regularly with films for use in their class work. The subjects covered, as already noted, are biology, geography, civics and home economics. These were chosen because the film subjects most readily available fitted into these grades best.

The Curriculum Committee of the Visual Instruction Association, of New York, made up of producers, distributors and producers of films, with sub-commit-

tees on the various subjects covered, coöperate with the visual instruction department of the city schools in selecting and recommending the films to be used. Lists of subjects, such as given in Chapters VII and VIII, are furnished to the principals of schools having projectors, in order that their teachers may indicate the subjects which they desire illustrated by films. These films, preceded by suitable study outlines, are delivered to the school on the day before they are to be shown.

Following are suggestions issued by Dr. Ernest L. Crandall, Director of Visual Instruction, to the teachers of the New York schools who are making use of films for instruction:

The showing of the films should not be a novelty, an unusual diversion, but one step in an orderly process of instruction, planned to teach some concrete, definite topic in the course of study.

The ideal usage would be to screen the films in the classroom during a recitation period. The next best procedure is to assemble all the pupils studying the subject in the auditorium. Pupils of other grades should not be present if this is avoidable.

The main points covered by the film should be brought out in previous classroom discussion and brought home by classroom work both oral and written, following the showing. The teacher should have the greatest possible familiarity with the subject matter of the film. Previewing is the best means of acquiring this familiarity.

There should be no talking while the film is going on, as the necessity for auditory attention is an unnecessary distraction. It is better pedagogy to run the film twice if the time permits. To increase memory training the taking of notes should be discouraged.

It is well to follow the showing of the film by questions in the auditorium or following the recitation, preferably both. Never should there be lecturing with the film or following it. As much of the discussion as possible should be handled by the children themselves. Questions should require thought on the part of the pupil, train his memory, provoke and stimulate the habit of correct and accurate observation. Above all

they should be specific. Avoid such generalities as "What did you see in the film?" "Tell about the eye, etc." Such questions as "What parts of the eye did we see in the film?" "What part corresponds to a lens in the camera?" "How are forest fires detected?" cover definite points and will train children to do their own thinking. Every teacher should devise his own questions as occasions require.

Wherever practicable films should be preceded by lantern slides showing the high points of the film. Each should be discussed by members of the class, guided by the teacher's questions. Lantern slides should also be used in the follow-up lessons as a review of the film. Here the socialized recitation may be advantageously used, a bright pupil acting as a chairman conducting the lesson.

After the ground has been thus thoroughly gone over, the final step is written composition. By this means the pedagogical value of the film is crystallized and becomes the child's permanent possession.

These very helpful suggestions conclude with the statement that "these thoughts are the results of a year's experience in the use of films in the schools of New York."

The principles enunciated in Dr. Crandall's suggestions show the keen appreciation of pedagogical principles of the successful and efficient educator. They are based on a very short experience in the actual work of visual instruction in the public schools but a long and effective experience in the general art of teaching and it is extremely gratifying to us that they confirm our contention that the best form of the excellence of visual instruction and of the methods used in its practice is the application of tried and proven pedagogical principles to the new medium.

In this connection the attitude of Mr. Rabenort is refreshing. He too is conducting tests, in Public School 55, the Bronx, New York, to determine the value and the manner of utilization of the still picture and motion picture, to make comparative studies of the textbook

and the motion picture and additional tests to find out the cost per capita for textbooks and the cost per capita for motion pictures and to determine if it is possible to substitute one for the other or if it is necessary to have both, and, if so, what justifies the extra expenditure.

We know of no tests that will prove more interesting or useful. However, Mr. Rabenort himself is so convinced of the value of films in education, after seven years of experience with them, and is sufficiently satisfied with prevailing methods that control groups are no longer used in conducting these experiments, which are to extend over a period of several years, He does not feel justified in withholding the advantages of visual instruction from any group of pupils.

In the Newark Schools

Newark, N. J., has been one of the most progressive cities in the country in the use of visual instruction, owing to the splendid work done by Dr. A. G. Balcom, Assistant Superintendent of Schools, who is director of visual education activities and a pioneer in the work.

The film service is organized for schools and supplied in four circuits [writes Dr. Balcom]. In alternating schools, films are shown one day per week all day in the school auditorium. In other schools having projection outfits, films are shown once in two weeks, in other schools as occasion demands, by means of the portable outfit. About 25,000 feet of film is received each week, inspected, lists of titles and a digest made. Lists of titles and the digest are sent to the teachers together with these written suggestions:

1. It is necessary to have a reaction of the film with a development of the impressions made by it.

2. Teachers must use the digest. One copy is filed at the principal's office, who furnishes as many copies to teachers as needed.

3. Pupils should be trained to observe the film, carefully noting how the film visualizes the situations set forth in the titles.

4. Teachers will find films an excellent source of language material. They should see the films themselves when possible.

5. Pupils should be trained to see the important things with the less important as a background. The teacher should intensify the interest, stimulate thought, quicken mental alertness and increase the powers of observation of pupils under them by means of films.

In summing up what has been done to date in Visual Education in the Newark schools Dr. Balcom says:

The teacher is sent a list of questions regarding the film and drills the class on it for *several days.* She stresses the features to look for in the picture. Sometimes the reel is shown twice. The pictures are then discussed in class and sometimes a written review is conducted. We have found that it is advisable to show the film twice wherever possible, both before and after discussion.

Even with the preliminary preparation the pupil may miss an important point and frequently does, as we have found from experience. "Why, I did not see that at all," is frequently heard from the less observant pupils. Then again wrong impressions are sometimes gained. The unreliability of witnesses all viewing the same occurrence is well known. Viewing the film twice will correct wrong impressions and drive home the right ones.

Their use of portable projection machines makes it possible for every school in the Newark school system to enjoy some of the benefits of motion pictures in instruction.

A Visual Education Club has been organized in the Newark schools. It is composed of teachers, principals and supervisors who believe in visual aids and use them. They meet and discuss theories, methods, experiments, thus giving the others the advantage of their personal experiences.

A teacher of geography in one of the Newark schools made use of all forms of visual aids most effectively in a lesson on Brazil. She used maps, charts, diagrams,

models, pictures, slides, curios, exhibits and motion pictures.

Her seventh-grade class decided to study Brazil under three topics: (1) My Rubbers and Raincoat; (2) My Chocolate Candy and Cup of Cocoa; (3) My Mother's Cup of Coffee.

The class was divided into three groups, each group being given one topic to develop. One of the first things the children did was to go to the Visual Instruction Department and find what films, slides and stereographs were available for their subject. These were requisitioned. The films were used as a background, a film on Brazil giving the atmosphere which Doctor Balcom deems so necessary for an adequate understanding of a subject. Other films showed some important industries, *How Rubber Is Made* lending itself particularly well to topic 1. A member of the rubber group wrote a short play which other members acted out, thus dramatizing as well as visualizing the lesson. In preparation for this lesson, which continued over a period of several weeks, the pupils wrote stories and descriptions, gathered pictures, drew maps, and collected articles. They learned how to gather data and materials on definite subjects, how to evaluate it and organize it. They went out and found their own visual aids. They lived geography and learned that geography deals with their own lives and that they not only live geography but eat geography and dress geography. This they learned most effectively through motion pictures on such subjects as fruit growing, wheat raising, water highways. Through films they learned also the relation of industries, products, means of communication and methods of transportation to the physical characteristics of the countries. Through the same

films they learned to understand how physical conditions determine the life of the people—the Alps developing the sturdy mountaineers; the prairies the roving cowboys; the Sahara desert the nomadic Arab. Through a film on coal mining, for example, they were taught to visualize in the smoke of the city chimneys the lives of the many who serve them. By accurate films showing American life and American industries the misconceptions of many newcomers to this country can be corrected and students can be taught Americanism in its best sense. So this geography teacher found from her own experience.

Personal experiences such as the one just related are included here not only because they may prove helpful to others and offer valuable suggestions but because they are highly significant in themselves. This geography teacher undoubtedly had initiative and vision. She believed in making use of all available visual material, from the package on the pantry shelf containing sugar to the film on *How Sugar Is Made,* in order to teach geography so that her pupils would live the subject. But it is very evident that in educational evolution only the best teacher combined with the best textbooks and the best available visual material can produce the best results. Instead of the films supplanting the teacher, it is the able teacher who can put real education into the informational film.

It is doubtless true that if the child of average intelligence reads the story of sugar making he will retain a portion of it, and if he sees the same story in a film he will probably retain more, but if both means are used by a teacher who knows his subject and knows how to present it so that it becomes a real, a living, a

personal thing, then the pupil will really learn facts that he will never forget.

It is well to pause here and dwell upon a fact of the truth of which practically every student of visual education is convinced, namely, that motion pictures and all visual aids are merely valuable teaching aids, and the more able the teacher the more valuable films will prove; how valuable when rightly used, only a comparative few have as yet discovered.

In the Chicago Schools

Dudley Grant Hays, director of Visual Instruction in the Chicago Public Schools, believes strongly in using films to "build a background and drive home a lesson," and in correlating films with other visual aids. He says:

> Visual Education is an aid to the study of life and its problems, which are—how to obtain (1) food, (2) shelter, (3) clothing, (4) recreation and amusement. Slides, photographs, stereographs and films can be used with tremendous effect to build up for the child a well-rounded conception of all that enters into the production and distribution of food. Give each child in the class some one specific thing to do as his part in building up the thought content of the lesson. One group might collect and bring for study all photographs obtainable on the subject. Another group might locate and select films on the subject, another locate books in the library, another visit Associations of Commerce for material and write commercial companies. All of these things build up the important habit of research and familiarize the pupil with the everyday sources of information.
>
> In studying the problem of clothing build the background with films that deal with the making of shoes, wool, silk and all those other fascinating process films which are now part and parcel of every one's education.

In Chicago, where motion picture equipment has been gradually introduced into the public schools until,

at this writing, one-sixth of the schools are equipped, with others to be equipped just as soon as funds are available, the visual education materials are so arranged that the teacher can use stereographs in preliminary work, slides for general discussion, and films to drive home the lesson. Discussing the method of using films, Dr. Hays says:

> We show sections of film which will be of greatest benefit to the children in getting correct ideas of the subject under discussion—50, 100, 500, 1000, or 2000 feet as needed, our aim being to give just enough of the film portrayal to make the lesson effective, then stop it and discuss it.

In the Detroit Schools

Detroit is another progressive city where films are being used effectively in education. How they started their film work and how it evolved may prove stimulating to other readers.

Mr. J. H. Wilson, former Director of Visual Education in the Detroit Schools, at the end of his first year's work, wrote:

> One year's work in fourteen schools in Detroit has shown some positive results which increase our faith in the visual venture. Films save time. They teach children to organize their statements effectively. They give an intimate knowledge of the workaday world.
>
> We show films in the Detroit schools [continues Mr. Wilson] on Mondays, Wednesdays and Fridays to fourteen schools grouped in three circuits. Tuesdays and Thursdays are delivery days for films and portable projectors. The films are shown in auditoriums and classrooms. Teachers have proven satisfactory operators. We have shown films from seven to ten thousand children a week at a per capita cost of eight mills. We rent our films but hope to build up a film library and put films into any classroom in Detroit any time they are needed. We have shown available literature stories, travels into many lands, but the greatest part has dealt with industries. A comedy was used once as a filler but was rejected by the

pupils, who said they wanted something better—an educational film!

The Detroit plan another year will be to experiment with pictures on different phases of a definite topic over an average of three weeks with an idea to assist in correlating the various school studies. We may spend October, for instance, studying Holland. Films would be used to cover in general,—agriculture, general industries, architecture, dress, games, customs and general folk lore.

The experiences of still other pioneers in the field of visual instruction might be multiplied indefinitely. The educational film magazines have been filled with accounts of their experiments and conclusions.

In a Philadelphia School

The way in which films are used in the James G. Blaine Public School of Philadelphia is typical. The principal, Edwin Y. Montanye, writes:

Motion pictures have formed a part of the regular instruction since September, 1920. The Home and School Association purchased a standard motion picture machine and the Board of Education installed the required fireproof booth and supplied the electricity and power.

The equipment was placed in the school auditorium, a silver screen hung on a roller above the platform with dark shades at the window completed the equipment. One of the men teachers learned to operate the machine and secured a license.

The school was organized on a duplicate plan, a modified Gary system. All day, Fridays, was given to visual instruction in the auditorium. Five groups of pupils spent one period of 55 minutes each in the auditorium, approximately 1,200 children receiving film instruction during the day.

The children received preliminary instruction before going to the auditorium to see the film. They were told some of the things for which to look. The film was discussed after the projection. Incorrect impressions were then cleared up and the particular message of the reel driven home.

This principal attacked his problem in a businesslike way. His methods are practical so far as they go.

The pupil was given preliminary instruction and told the important things for which to look. The textbook and teacher prepared the way. The film told its story in its own vivid language. The pupil saw what he had heard about. What he had seen he discussed with his fellow pupils, who may have seen points he missed. In the discussion, incomplete impressions were completed and wrong impressions corrected.

A Journey Geography Lesson

How the visual idea was used to teach geography to an extremely backward group of seventh-grade pupils with results that were surprising even to staunch advocates of the visual method is here related because of its wide application.

Not only could the class not keep up with their own grade in the study of geography but their lack of geographical knowledge was seriously retarding them in other subjects. The teacher realized the futility of taking them back over the same geography text, which would lack all freshness for them, and they must be taught the essentials of American geography—but how? She told them to imagine themselves a group of French children coming to America for the first time; and then began to attack the problem in a practical way.

First, steamship routes were studied and the port of debarkation and arrival decided upon, maps were made and a travel book started. It was decided to stop first at New York and this called for a study of the environment, bays, harbors and transportation system of the great metropolis. Historical Boston was selected by popular vote as the second stopping place. Thence the journey was made to the cities of the St. Lawrence

and then the class cruised down the Atlantic coast, going up the Potomac to Washington, back down the coast to the Gulf, stopped at New Orleans, journeyed up the Mississippi to the Great Lakes, thence by train westward, reaching the Pacific Northwest and traveling south to Mexico, crossing the country to the Caribbean, thence by boat again through the Panama Canal to the Pacific coast and then on a cruise around South America. In all about eighteen weeks was given to the trip.

The methods used varied according to the subject in hand.

Motion pictures played a large part. The class saw New York, Puget Sound, the city of Tacoma, the Panama Canal and other sections by means of motion pictures. Slides were used in the study of nearly all the subjects and in some cases, such as the story of iron ore, proved most valuable. Both wall and desk outline maps were made and added to continually. Coloring the map frequently added interest. The sand table was useful in many cases. A model was made of the Panama Canal, for example. Although all forms of visual aids were used the textbook was not neglected. On the contrary, pupils were sent to the text and to references selected, including books and the worthwhile magazines, for all the information they could gather.

The experiment was considered a decided success. Place geography was strengthened and history, geography and English became related subjects. The story of the trip, written by members of the class, was first passed by the English instructor before it could be placed in the travel book. But most important of all, the country in which the children lived became real, *their* country.

The methods here used in applying the visual idea

to teaching geography to a backward group were practical, comprehensive and effective. The motion picture was only one of the aids used. In such motivation it has a definite and a valuable place.

In a Texas School

A practical method is used in the Franklin School at Port Arthur, Texas, one of six schools in a town of 22,000. Three teachers are assigned to the auditorium, carrying no other work. One of the teachers is in charge of visual instruction, to which three days a week is given, two days to motion pictures and one day to lectures with slides. Miss Terry, the director of visual instruction, writing of her work, says:

> The children come into the auditorium daily by grades, each grade having a separate period of forty-five minutes. With this excellent arrangement we are able to correlate the pictures with our course of study. Through conferences with the teachers, academic and special, I become familiar with what the children of each grade are studying in each subject, and then schedule the picture accordingly.
>
> We are using two projection machines, a Powers 6B and a Zenith. We also have a Balopticon which we are using for slides with our new Trans-Lux screen. Placing the machine on the stage back of the screen, there is no necessity for drawing curtains.
>
> I find children keenly enjoying a lecture illustrated with slides after they have seen the same subject in motion pictures. There was a time when the children registered disappointment at seeing films other than features. Now they see purely educational films more or less intelligently and enjoy them. The best work we have done in visual instruction has been for our classes in geography.

Miss Terry then outlines a course in geography for the New England, Middle Atlantic, Southern, Central and Western States and for certain foreign countries, from which we quote in part to show how this teacher solved her problem.

VISUALIZED GEOGRAPHY COURSE

THE SOUTHERN STATES

(1) General. Film—Southern States (SVE).

(2) Agriculture: Cotton. Films—The Land of Cotton (SGE), Cotton Ginning, Marketing and Manufacturing (USDA).

(3) Sugar. Film—How Sugar Is Made (Tex. A. M. College).

(4) Rice. Film—Rice Industry (Ha).

(5) Lumbering: Soft Pine. Film—Story of a Stick (LB).

(6) Ranching. Film—From Texas Trail to Your Table (Ar).

(7) Oil. Films—Glimpses of the Texas Oil Fields (BCE), Oil Industry (Ha).

While it is more effective, where possible, to have a projector in the room of each class to which motion pictures are to be shown, in order to save the time and distraction of going to the auditorium and to make the pictures more an integral part of the work of that class, where this is not practicable, the plan of having the classes go to the auditorium for the pictures is the next best alternative and has proven decidedly workable.

In a Hackensack School

One example of the public school tests being conducted for Dr. Freeman, University of Chicago, is in Hackensack, N. J., under the direction of Miss Marietta L. Higgins, until recently a member of the Visual Education Committee of the Board of Education of Berkeley, California, and now teaching geography in Hackensack. Following are typical lesson plans which have been carefully arranged and standardized by Miss Higgins for use in her tests and which involve the use of films and other visual aids. These tests, like those

of Mr. Rabenort in New York, are infinitely more valuable than the tests referred to in Chapter IV, in that they are also part of the regular classroom work and are therefore able to be conducted under normal conditions by experienced teachers.

LESSON PLAN NO. 1

Subject—Belgium.

Project—"How the People Live and Work."

Sub-topics to be given and handled by individual pupils or by groups according to the judgment of the teacher.

SUB-TOPICS	VISUAL AIDS
Situation	Maps
Surface	Geographies
Government	Books
History	Films
Industries of People	Books, still pictures, stereographs, slides, and films
Cities	Slides, still pictures and films
Home Life	Books, still pictures and films
Types of People	Films
Products	Still pictures and films
Appreciation Lessons	Slides and films
Checking-up Lesson (Oral)	Films

LESSON PLAN NO. 2

Subject—South America.

Project—Three Steamship Companies, with offices in San Francisco, New Orleans and New York. These offices regularly conduct the business of these companies. Representatives are sent to all the seaports at which these boats will touch. Letters are exchanged. Imports are ordered, exports are arranged for.

Representatives at large buy and send to shipping ports bananas, cocoa, rubber, wool and hardwoods.

Visual Aids—(1) Still pictures; (2) Slides; (3) Films.

South America is studied in relation to our trade with our sister continent.

Films on the banana industry, rubber industry, nitrate industry and the coffee industry are obtainable in short lengths. They are invaluable.

In discussing these lessons Miss Higgins says:

> To obtain the best results, the teacher must carefully prepare her lesson in relation to the visual aids she will be able to use. In other words, she must know her material as well as her subject. To the interested teacher, this is no hard task. The results will far outweigh the effort.
>
> A class that was taught South America by the method outlined in Lesson Plan No. 2, finished four weeks sooner than any other class I had taught and checked up better. The class averaged 85% on a test on South America given to the class by the principal of the school.

In the tests which Miss Higgins has thus far conducted, with all the control factors standardized, the classes using visual aids have consistently averaged at least twenty per cent higher than those deprived of them.

A specially selected series of the Burton Holmes films on Belgium were used in connection with Lesson Plan No. 1, as an appreciation lesson, after the rest of the work had been done. Before the showing of these films, but after all other visual aids had been used, seventy-two per cent of the class averaged seventy per cent and above. After the showing of the films, the same questions were asked as in the previous test, without an opportunity being given the pupils to discuss the lesson further or to check up on their previous answers. The result of the second test showed (1) ninety per cent with seventy and above, (2) the average of the original seventy-two per cent much higher and (3) those originally below seventy per cent averaging about fifteen per cent higher than before.

Miss Higgins is also responsible for the statement that she is able to shorten the course in geography in the grades by six months, by the use of visual aids including motion pictures, and do the work better.

She advocates the use of films in five hundred feet lengths, taking six or seven minutes to show, as better suited to school needs than the longer units, and insists that they be shown in the classroom instead of the auditorium, in order better and more closely to tie them up with the class work.

It is interesting and highly significant that practical teachers who have gained successful experience by long and observant use of motion pictures in instruction, even though approaching their conclusions through different channels, arrive at so many similar findings—convincing evidence that the conclusions are sound, the methods pedagogically correct.

XI

TECHNIQUE OF INSTALLATION AND OPERATION

Before introducing films into the school curriculum the school superintendent, principal or teacher wants to know: (1) what is needed; (2) how much it will cost; (3) how to install the equipment, and (4) and how to use it.

Let us start with the simplest possible equipment, taking as a concrete example a school which began its film instruction work with a small portable projection machine, a stand or table on which to place it, and one extra reel. The total cost was a little over two hundred dollars. No screen was needed because the walls of the room, being light buff in color, made an excellent screen. If the walls of a classroom are smooth and of a neutral shade, light buff is probably the best, no other screen is needed. The back of a large wall map makes an excellent screen. Roller screens that can be pulled down over the blackboard are often used. These range in price from about $15 for a six by eight white sateen screen to $200 and up for a de luxe screen of the same size. The best portable projectors cost from $180 to $300. Extra reels—we recommend two to start with—cost from about seventy-five cents to one dollar each. An extra table or stand can usually be found in the school equipment. Film instruction then can be started at a minimum cost of $200 to $300, depending largely upon the projector purchased.

Even with the simple equipment enumerated a few

accessories are desirable and should certainly be added at the start if films are to be used with any degree of regularity. It is always well to have at hand a twenty-five cent bottle of film cement for splicing broken film, a pair of scissors and a package of razor blades, to use for making splices, and a pair of rewinds.

If the films used are always to be returned to the exchange from which they are rented, immediately after use, splicing equipment will not be needed, but if they are to be run a second time before being returned, splicing equipment and rewinds may prove indispensable. Paper clips can be used to join the film together if it breaks *after* it passes through the mechanism of the projector and it is not to be run again, but it should not be run again until all clips are removed and splices made.

The Ideal Equipment

The ideal equipment for a modern, up-to-date school wishing to use films regularly would consist of a professional motion picture projection machine, or preferably two, installed in a fireproof booth, erected and wired in accordance with all rules, regulations and requirements of the Board of Fire Underwriters and in conformance with local fire regulations, a good screen and a fully equipped projection room. This would cost from $2,000 to $3,000.

One High School in the West spent $2,500 for motion picture equipment as follows:

Two projection machines	$1,000
Generator (direct current)	850
Screen	450
Miscellaneous equipment	200

The money was advanced by the Board of Education and repaid within two years. The same High

School soon bought a small portable projector for classroom use from the proceeds of the Friday night "movies," which also paid for all rentals for classroom films. This High School found that the best equipment and service paid.

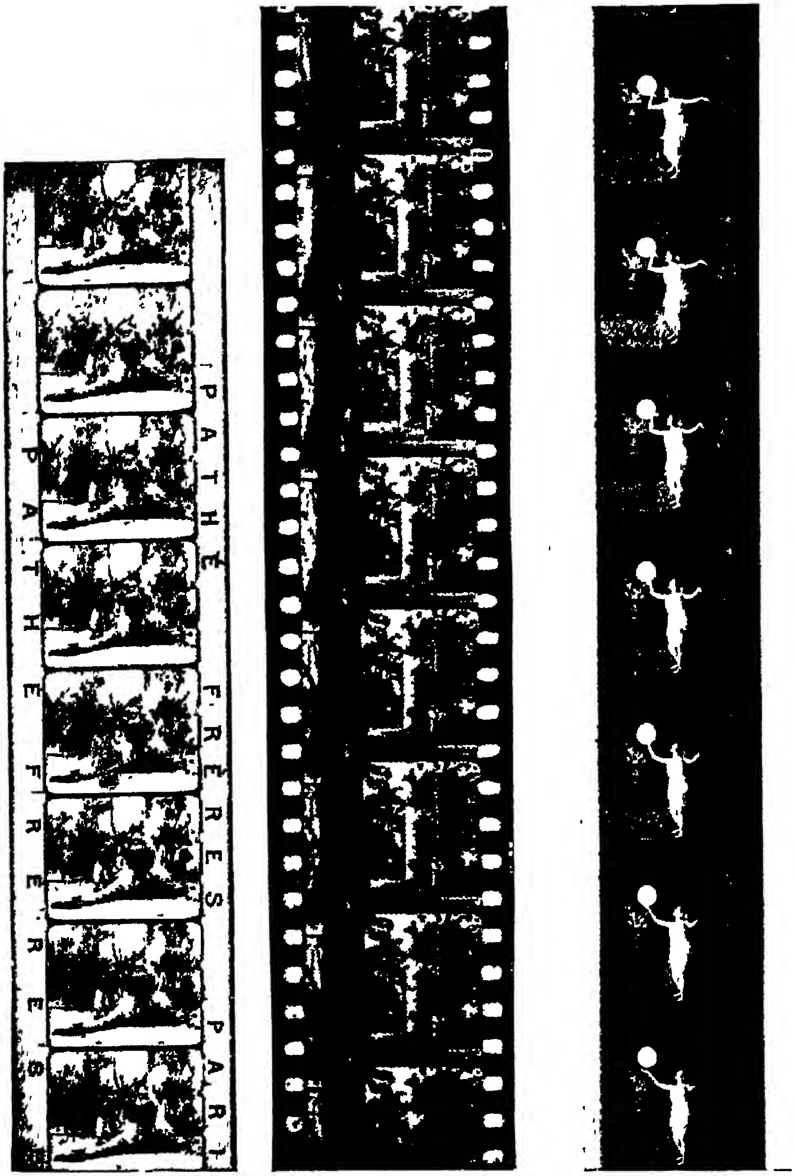
Here we have the two extremes, an exceedingly simple equipment with which motion pictures can be introduced and a complete equipment for a school auditorium.

Equipment for the motion picture palaces is of course much more complex and expensive than that which any school would need. For example, in the Capitol Theatre, New York City, the largest theatre in the world, seating 5,000 people, there are four completely equipped projectors of the latest type in a projection room 41 feet long by 19 feet deep, with windows opening on the street and exhaust fans, a vent pipe running from the lamp house of each projector to the open air. The current (D. C.) is supplied through five 125 multiple unit rheostats. Each projector draws 125 amperes at an approximate pressure of 68 volts. (The usual amperage ranges from 20 to 50.)

The throw is 107 feet and the picture is projected on a special white screen. The projection and the musical score are synchronized through the medium of speed indicators. In the rewind room is a specially built vault for the storage of film. The complete equipment represents an expenditure of approximately twenty thousand dollars.

Different Kinds of Film

Before determining what kind of projector to buy, a decision must be made as to the kind of film to be used.



(1) (2) (3)

THREE TYPES OF FILM

(See List of Illustrations for description)

Professional standard film is 1⅜ inches or 35 millimeters wide. It comes in two kinds, nitro-cellulose or celluloid film, called "inflammable," and acetate of cellulose, called "slow burning" or "safety" film. The slow burning film is also made in narrower width, 28 mm. or 1$\frac{1}{16}$ inches, called "safety standard," 16 mm. and 9mm. Positive inflammable or celluloid film is not made in these narrower widths.

We have no disposition to take sides in a controversy which has become violent regarding the relative merits of the "professional standard" and "safety standard" or 28 mm. types of film. We shall confine ourselves to stating briefly the actual facts as we know them and allow the reader to draw his own conclusions.

The main question involved at the present time is that of inflammability of the standard width on the one hand versus the limited supply of safety standard on the other. Nitro-cellulose film is highly inflammable and has to be used with care to obviate fire danger. On the other hand, a vastly greater supply of subjects is available in the standard width stock. There is not one-tenth of one per cent the films in the narrow forms that there are in the standard and what is obtainable can be had in a very limited territory. The fact that the safety standard has been in use in this country for ten years and has not in that time been built up into a larger library makes us fear that an adequate library in this or other off-standard size is not a future probability.

Purchasers of the safety standard equipment have found that they soon exhaust the available library and then, unable to obtain additional pictures in sufficient quantity, undertake to turn their narrow width projectors in as part payment on standard machines. There

are, on the other hand, also instances where, after having fire trouble the owner of a standard width machine has exchanged it for a safety standard type.

Some excellent school subjects are available only in the safety standard form, and the champions of that film point out that for pedagogical use a distinct character of subject matter will be built up which can be had only in the narrow width.

Where films are being used extensively in a school or school system in the places where narrow width service is to be had, it might be well, if funds permit, to have both types of projectors. A number of schools have. The fact that school rentals for narrow width films are less than those of professional width appeals to educators. Before investing in the narrow width type, however, the teacher should assure himself by other means than merely perusing the catalogue what and where his actual supply of films is.

Announcement has recently been made by the Eastman Kodak Company concerning what they term a third standard in the size of film, a ribbon of acetate stock, 16 mm. wide.

For the use of this stock they have produced both a camera and a projector, small in size and light in weight. While the immediate purpose of this development is primarily home and amateur use, the Eastman people expect to be able ultimately to popularize it for school use. The resources of the Eastman Company make the project worthy of consideration. Many advantages are claimed for this narrow width of film, because of a special emulsion which gives a much finer grain than in ordinary film and a new and efficient system of illumination, by means of which a picture can be obtained up to ten feet in width, it is equal in every

way, in detail, general quality and brilliancy, to the larger pictures in the theatre. This being so, it is claimed that for classroom and small auditorium use the small film has every advantage over both the "professional" and "safety" standards, but most particularly in economy. The new film is one-sixth the area of the professional, very much cheaper per foot, and less footage will be needed for the same amount of picture. There are forty frames per foot instead of sixteen as in the standard and four hundred feet is equivalent to a full one-thousand-foot reel of ordinary film. The smaller bulk of reels and machines will be an additional advantage. The fact that it is on slow burning stock will commend it to school use.

The Eastman Company proposes later to supply for this size an adequate library of films. For at least the next two years, however, they will confine their efforts to supplying the amateur field with machines and raw films. The price of the raw stock will include development after exposure. For amateur use, a direct positive is made in the camera, thus eliminating the cost of printing. Prints for school and similar use can be made by reduction printing from standard negative. In other words, prints in the smaller size can be obtained from the millions of feet of standard-size negative already in existence. The fact that the Bell & Howell Co., prominent makers of cinema equipment, are manufacturing cameras and projectors for the 16 mm. film and that the manufacturers of the Actograph camera, originally designed for use with 17½ mm. film, are reconverting it for use with the 16 mm. width will help further to standardize this size. Pathé has also recently evolved a still narrower film, 9 mm. in width.

It will be interesting to watch which, if any, of these

narrow widths obtains any permanent footing in school work. They possess the one great advantage over the standard slow-burning film of much lower cost.

Austin C. Lescarboura, Managing Editor of *The Scientific American,* writes regarding inflammable versus slow-burning film:

> The usual professional standard film has a celluloid base, or, to use the language of the chemist, it is made from nitro-cellulose stock. This material is little different from gun-cotton, and as such it is of course highly inflammable. Still, there is no reason why the careful operator should have any trouble with celluloid film. Our leading theatres handle mile after mile of film each working day, yet never experience any trouble with the highly inflammable material they are handling. Celluloid film will not blaze up by itself; a blaze or intense heat must be applied for a period sufficient to start a blaze. The majority of projectors today are so designed as to reduce the fire hazard to an absolute minimum, being equipped with such safeguards as automatic shutters, which drop down in the path of the source of light when the speed of the machine drops below a predetermined point; fireproof magazines which hold the film reels, and fireproof traps through which the film passes in and out of the magazines. At worst only a few feet of film, which happens to be exposed between the upper and lower magazines of the usual projector, can burn, causing little or no damage.
>
> The greatest hazard connected with the use of inflammable films is while the films are not in actual use. The inveterate smoker is a positive nuisance where films are being unpacked, examined, rewound or otherwise handled. In fact, film should always be kept in cans until it is actually about to be placed in the projector. There is no excuse for having a film fire if ordinary care is exercised.
>
> Of course it cannot be denied that there must be a certain sense of security that goes with slow-burning film. Such film is made of an acetate-of-cellulose stock, which, unlike celluloid, burns quite slowly if at all. If a match or great heat is applied to celluloid, it immediately flares up with a hot, rapid flame. The slow-burning stock, on the other hand, begins to burn if one is persistent, and then only with a weak and lazy flame which generally dies out as soon as the source of the fire is removed.

Of late years manufacturers of motion-picture film, which is known as the raw stock in blank condition, have turned their attention towards acetate-of-cellulose or slow-burning stock, so that the non-theatrical exhibitor can use slow-burning films in any standard projector or portable projector with absolute safety. Such film is somewhat more costly than the celluloid stock, but more and more producers are turning to such film for educational and other non-theatrical reels to be used under conditions far from being as safe as those in the average theatre. In fact the motion picture industry in general is of the opinion that in time celluloid must go. It may not be next year or five years from now, for a heavy investment is represented by the millions upon millions of feet of celluloid film now in general circulation; but eventually all film will be of the slow-burning variety, even though such film is more costly, thus eliminating all possible source of danger from both non-professional and professional exhibitions.

Although there are weighty arguments to be found on the side of the use of the sub-standards based on safety and economy, it is the opinion of the writers that the professional standard width of film will permanently prevail, but that this will ultimately be accomplished through the adoption of slow-burning film, not only for the classroom but for all purposes. The larger non-theatrical school film companies are now placing all their films on this stock, as is the U. S. Department of Agriculture. So, too, are many industrial concerns which are having films made showing their products or processes. There is a bill pending in Congress now requiring the general adoption of the acetate film by the year 1925, and though this particular bill will probably not pass, some such bill, we think, will some day become a law.

The use of the acetate film instead of the celluloid for theatres as well as for school and home use is strongly advocated by the National Board of Fire Underwriters. Objections to its use are the greater tendency to dry out and become brittle if not kept in

a moist container or vault and that it is less efficient and costs more than celluloid film of the same size. It is manifestly desirable that one standard be adopted which can be used satisfactorily both in the large auditorium and in the classroom, so that the same film which is shown in the auditorium for the entire school may also be shown in the classroom and in the church or school hall.

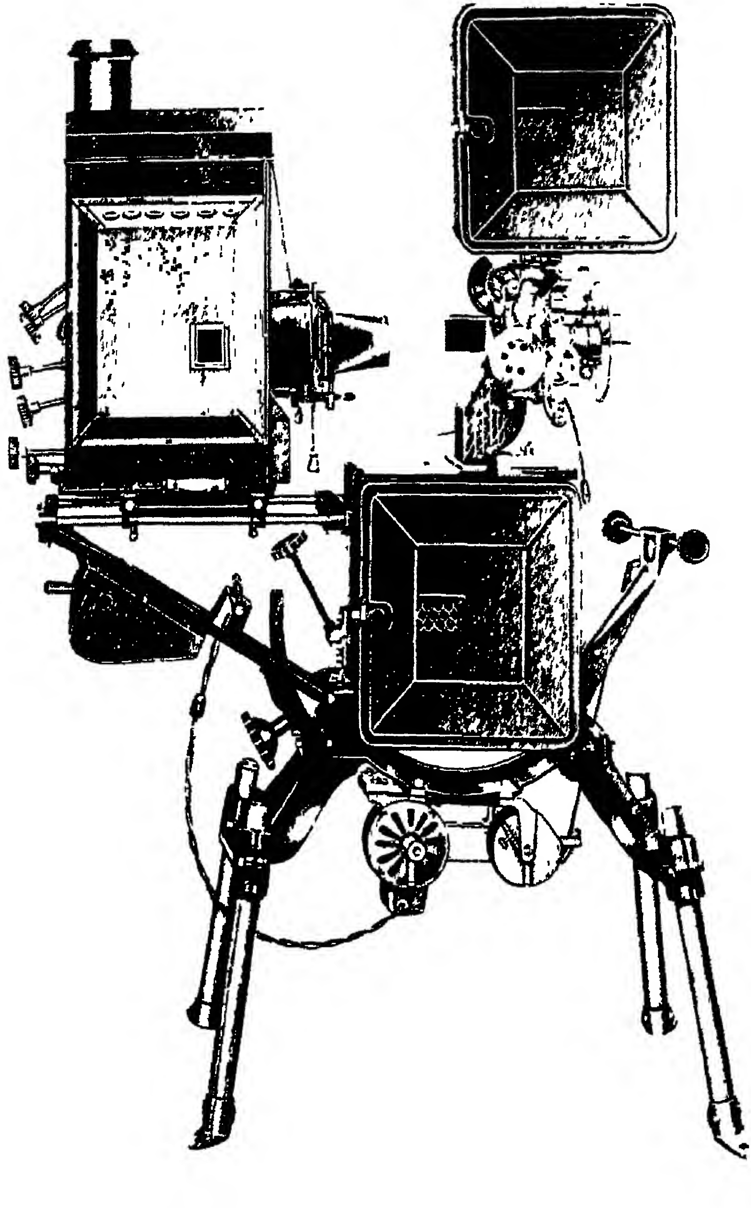
There should certainly be in every well-appointed school auditorium a projector on which can be run the best of the great photoplays, news reels and other suitable films of the regular sort. The time will never come when all of these will be produced both in the regular size and in a sub-standard form. Hence a school or church, in order to have access to all types of film, would need to have at least two types of projectors and maybe more, depending upon how many of the sub-standard sizes are in use.

Doubt as to which machine to purchase has delayed in many schools the installation of any projector and has been a serious factor in holding back the advancement of the use of films in visual instruction.

Laws and Regulations

One of the most troublesome problems connected with the use of projectors in schools is the lack of uniformity of the laws and ordinances on the subject and the harshness of some of the rulings.

In many jurisdictions no provision whatever is made for the use of films in schools, and the schools, therefore, are required to meet the conditions laid down for theatres, and in some places, by literal interpretation of law, not even a safety-standard machine, using only slow-burning films, can be used without a fireproof



IMPROVED PROFESSIONAL PROJECTOR
(See List of Illustrations for description)

booth according to certain rigid specifications. In most places, however, the narrow-width machines can be used without restrictions, and in many places the enclosed or suitcase type of standard-width projector can be used without booth if the slow-burning film is used.

Pennsylvania, Michigan and Indiana are examples of States permitting the use of portable projector without booth if slow-burning film is used. Some States, such as Massachusetts, Connecticut and Rhode Island, take the unreasonable stand that no projector capable of using inflammable film can be operated outside a regulation booth even though actually using only slow-burning stock, on the assumption that the temptation to use inflammable film will be too great to resist. On the same theory a portable machine is not legally permitted *in* a booth in Massachusetts, because of the facility with which is might be removed and used elsewhere without a booth. Of course these are ridiculous extremes, which like much other extreme legislation often cause the laws to become dead letters.

The State of New Jersey, until recently one of the most rigidly unreasonable in these matters, has now manifested its confidence in its teachers by providing that a certain type of approved portable projector may, under the supervision of the Board of Education, be used in the classroom with any kind of film, without a booth. The Legislation Committee of the Visual Instruction Association of America is working for the general adoption of such an arrangement. Until this happens or until slow-burning film stock is generally adopted by all or a large part of the motion picture industry, some doubt on the part of educators about to obtain equipment is unavoidable.

With this brief statement we must refer the interested reader, without further comment, to the voluminous literature on these subjects issued by the various manufacturers of projectors. But in the matter of installation do not take the advice of the maker of projection machines alone. Abide by the active local laws even if they be unreasonable. Inquire what are the local practices and follow them. Of course if the law be a dead letter and not enforced, it has not the full sanction of law.

Before making a decision as to the installation of a machine the teacher or principal should ascertain from the local authorities what these local practices are. It is not practicable to give such information in this book because the requirements differ so greatly not only in different States but in different cities and counties of the same State. Further, if the insurance regulations covering the school in question are more strict than the requirements of law, the advice or permission of the officials of the insurance company underwriting the school should be sought.

If the regulations contained in a proposed ordinance *for theatres* recommended by the National Board of Fire Underwriters are followed in so far as they apply to school work, all difficulties with fire and insurance authorities can be prevented. This proposed ordinance reads as follows:

AN ORDINANCE TO REGULATE THE EQUIPMENT AND OPERATION OF MOTION PICTURE MACHINES AND PREMISES WHEREIN THE SAME ARE OPERATED

Section 1. (*a*) By the term "picture machine," as used in the following sections, is meant any machine or device operated by or with the aid of electricity, calcium light or other

illuminant, and adapted or used to project upon a screen or other surface pictorial representations in which films are used.

(*b*) By the term "inflammable film" is meant any film whose base is nitrated cellulose.

(*c*) By the term "safety film" is meant any film having slow-burning characteristics as determined by the Underwriters' Laboratories or other suitable authority.

Section 2. From and after the passage of this ordinance no picture machine shall be installed, maintained, operated or licensed, except when in conformity with the provisions of this ordinance.

Section 3. Every picture machine using inflammable film shall be installed or operated within a booth, to be not less than 6x8 feet in size and 7 feet high. The booth shall be built of brick, tile, or plaster blocks, plastered on both sides, or of concrete, or of metal frame of angle iron not less than 1½ inch by 1½ inch by ¼ inch, properly braced to secure rigidity, and sheathed and roofed with sheet iron of not less than No. 20 U. S. metal gauge, or with ¼ inch hard asbestos board securely riveted or bolted to the angle iron frame; or 2 inches of solid metal lath and Portland cement plaster may be used.

(*a*) The entrance door into the booth shall be at least 2 feet by 5 feet, of the same construction as the booth, and so arranged as to close automatically by metal rope and weight attachment, or by a spring of sufficient strength and tension to keep the door securely closed.

(*b*) The orifice or opening for the operator's view, or through which the picture is thrown, shall not be larger than 6 inches by 12 inches, and shall be provided with a gravity door of the same construction as the booth, which door shall be held open by fusible links placed in series with fine cords, so arranged that one of the links is suspended directly over the film when in the slide of the apparatus, or the door shall be so arranged as to be normally closed and held open by pressure of the operator's foot.

(*c*) All shelves, furniture and fixtures within the booth shall be constructed of incombustible material, and no combustible material of any sort whatever shall be permitted or allowed to be within such booth, except the films used in the operation of the machine.

(*d*) Each booth must have an opening not less than twelve inches in diameter, for ventilation, which must be flanged to carry standard conductor pipe for exhausting the hot air generated in operating the machine. Connection for ven-

tilation should vent to chimney or outside of building, in order to carry off hot air or explosive gases.

Section 4. All picture machines shall be of a type listed by the Underwriters' Laboratories. Inflammable films not in the machine shall be kept within the booth enclosing the machine in boxes, with tight-fitting covers. Hot carbons taken from the lamps shall be deposited in a metal receptacle.

Section 5. The electrical wiring shall be in accordance with the rules and requirements for electric wiring embodied in the National Electrical Code. Each lamp connected with a picture machine shall be provided with a separate switch located within the booth. There shall also be two switches controlling the lights in the exhibition room, one of which shall be operated from the booth and the other so placed that it is within the reach of the ticket taker or other person stationed at the entrance door. There shall be provided a separate system of lighting, controlled by switches operating red signal lamps, and located within the reach of the ticket taker, and there shall be one such lamp placed at each exit, with a sign marked "EXIT" in letters not less than five inches high. The location of these signs and lights shall be determined by the Chief of the Fire Department.

Section 6. No picture machines using inflammable film shall be installed, maintained or operated in any building that does not abut directly upon a street, and in no case shall the main floor of such exhibition room be more than four feet above or below the adjoining street level. To overcome any difference of level on the ground floor, ramps shall be employed of not over one foot in ten feet; no steps shall be permitted. Exit doors shall be at the level of the sidewalk. In exhibition rooms directly abutting upon one street, the booth enclosing the picture machine shall be placed at that end of the room which is opposite and farthest from the street, or on a balcony. No room shall be used as an exhibition room unless it has at least one separate and distinct exit in addition to the front exit. In exhibition rooms located at the corner and directly abutting upon two streets, or on a street and an alley, the booth enclosing the machine may be located at the end of the room opposite to and farthest from either street or alley. All exits and entrances shall open directly from the exhibition room upon the street or alley or into a vestibule or lobby opening immediately into the street or alley. No exit in exhibition halls for picture machines shall be less than five feet wide and all exit doors shall be arranged to swing outward. The aggregate width in feet of such exits

shall be not less than one foot for each twenty persons to be accommodated thereby. All aisles shall lead directly to exits and all exits shall be directly accessible to aisles. No aisle shall be less than three feet in width

All seats in any exhibition hall for picture machines shall be securely fastened to the floor and shall be so arranged that there will not be more than six seats between an aisle and a wall and not more than twelve seats between two aisles.

No stage, platform or scenery shall be placed, maintained or allowed to remain in any exhibition room for picture machines unless of fireproof material.

Section 7. Incandescent electric lamps shall be used throughout for border lights, footlights and stage purposes.

Section 8. No individual, partnership or corporation shall be permitted to conduct the business of moving picture exhibitions using inflammable films, until the applicant therefor has procured from the Chief of the Fire Department his certificate that the premises where the exhibitions are to be given and the apparatus used in connection with the said exhibitions are in compliance with this ordinance.

Section 9. The Chief of the Fire Department shall have authority and it shall be his duty to revoke the license issued to any person, firm or corporation for conducting or maintaining picture machine exhibitions, when he shall be satisfied that such licensee has violated any of the provisions of this ordinance. Provided, however, before revoking such license opportunity shall be given such licensee to appear before said Chief of the Fire Department and show, if possible, cause why the same should not be revoked.

Section 10. The requirements herein named so far as installation of picture machines using inflammable film and the construction and location of booth are concerned, shall apply to theatres, churches, schools and public halls.

Section 11. Every person, firm or corporation maintaining or using a picture machine with safety (slow burning) film only and without a booth, shall file with the Chief of the Fire Department a statement that only safety, or slow burning, film will be used.

Section 12. Any person or persons found guilty of violation of any of the provisions of this ordinance, or failing to comply with the terms thereof, shall be fined not less than five dollars ($5) nor more than twenty-five dollars ($25) for each offense, and every day of maintenance of prohibited conditions shall constitute a separate offense.

Do not confuse *"safety"* film with *"safety standard"* film. The former refers to the slow-burning stock in any width, the latter refers only to the 28 mm. width.

Several sections of this ordinance apply only to theatres but if a school runs motion pictures for entertainment several nights a week it may be placed in the theatrical class, and the same regulations and rate of insurance would then apply as to theatres.

The significant facts to be remembered by the prospective or actual users of films are these: The National Board of Fire Underwriters frowns upon the use of nitro-cellulose or inflammable film anywhere. If it is used, a booth is required no matter what type of projector is used. The point is made here that the great hazard is in the handling of film itself and that film should be handled only in a booth, separated from the audience.

On the other hand, slow-burning film may be used in any type of projector without a booth, according to the Fire Underwriters' rulings, though some state laws and municipal ordinances forbid the use of *any* standard width film without a booth built in accordance with their specifications.

There is a clause in every fire insurance policy saying that the policy may be declared null and void if the policy holder increases the fire hazard without notifying the agent. Therefore, as a matter of precaution, it is well to secure a written permission from the insurance company, through the agent, to use films, even if a booth is used.

Architects' Plans

Architects of school buildings should not neglect to make full provision for motion picture projection in

the school auditorium. For a new school to be built in this day without the proper type of projection booth, complying with the requirements of the fire underwriters and the local laws and ordinances, is a serious and costly omission, for the school may find it necessary to install a booth which will probably cost considerably more than if it had been included in the original plans. Besides, an added-on booth is often unsightly and spoils the architectural lines of the room.

The architect and the school board should ascertain in advance the exact requirements of both the fire department and the insurance companies regarding booth, wiring, installation, etc., so that they will not be put to extra and unnecessary expense later. One school had the unpleasant experience of finding that a booth built when the school was erected, though absolutely fireproof, would not pass the local fire underwriters' requirements because it did not conform to the exact specifications laid down by them. There is still another instance where a concrete booth, though very much safer than the booth required by law, was not passed by the local board because it did not conform to the letter of the law.

Types of Projectors

Standard width projectors may be divided into three general classes—the professional, the semi-professional and the portable.

The professional type is the kind used in theatres and large auditoriums. They cost from about $500 upward, depending upon model and its attachments. The Powers, Simplex, the Motiograph, the Fiester, the Baird and the Graphoscope are examples of this group. They are not suited to classroom use but are the type

recommended for school auditoriums. In practically all cases they must be used in a fireproof booth made to specifications.

The professional projectors are equipped with a more powerful light than are the other types and should be used in all cases where the distance from the lens to the screen is over one hundred feet. For throws of this distance or more the arc lamp equipment should be used. During the past year new developments have been attained with Mazda lamps for use in motion picture projection with such excellent results that the time may soon come when the Mazda will entirely replace the arc, but that time has not yet arrived. We can recommend the monoplane filament Mazda incandescent lamp equipment for use in the professional projector when the throw is less than one hundred feet. Types of projectors below the professional are generally equipped solely with incandescent lighting.

Most of the portable projectors are self-contained in a suitcase type of box with handle for carrying and weigh between twenty and thirty pounds. The better known makes are the De Vry, the Acme, the American Projectoscope and the Portmanto (Graphoscope). They sell for between $180 and $300. Some of them are good for a maximum throw of 50 or 60 feet but, for the most part, they work better at not to exceed forty feet. They are the type pre-eminently suited to classroom use. They are safely built, with excellent fire prevention devices where needed, comparatively simple to operate and, within proper limitations of distance, show an excellently clear and steady picture. The suitcase or box is made of fire resistant material or is lined with asbestos and acts as a kind of booth. In selecting this type of projector great care should be

exercised in picking out the type that has a lamp strong enough for the distance of throw required. Other considerations, such as price, durability, etc., should be weighed and will doubtless influence the prospective purchaser.

The semi-professional group, as the name implies, occupies a middle position between the professional and the portable types and partakes somewhat of the advantages and shortcomings of both.

The group is represented by such makes as the Graphoscope, Jr., the Zenith, the Burwood, the Victor Animatograph and the Acme S. V. E. They sell at from about $250 up to $365. The Graphoscope, Jr., has the same mechanism as the professional model and can be equipped, at extra cost, with the Mazda monoplane filament lamp which will give a throw of one hundred feet or more, bringing it practically into the professional class. The majority of projectors of this group are equipped with lantern slide attachments which work satisfactorily. And while some of the professional type are so equipped, their light is too strong for glass slides and cracks them if left on view for more than a few seconds. The semi-professional types are lighter and cheaper than the professional models but have not their length of throw nor on the other hand the extreme portability of the portables. They have not a stronger lighting system than the best of the portables.

There are other light projectors, not of the suitcase type but of open construction. These are not usually as favorably received by the fire authorities and for the most part are not as efficient. The price of some makes of this type is as low as $50. While some of these cheaper machines give a satisfactory performance

at short distances, others are no more than toys. It is unwise to purchase for school use a hand-driven machine as are most of these cheaper types.

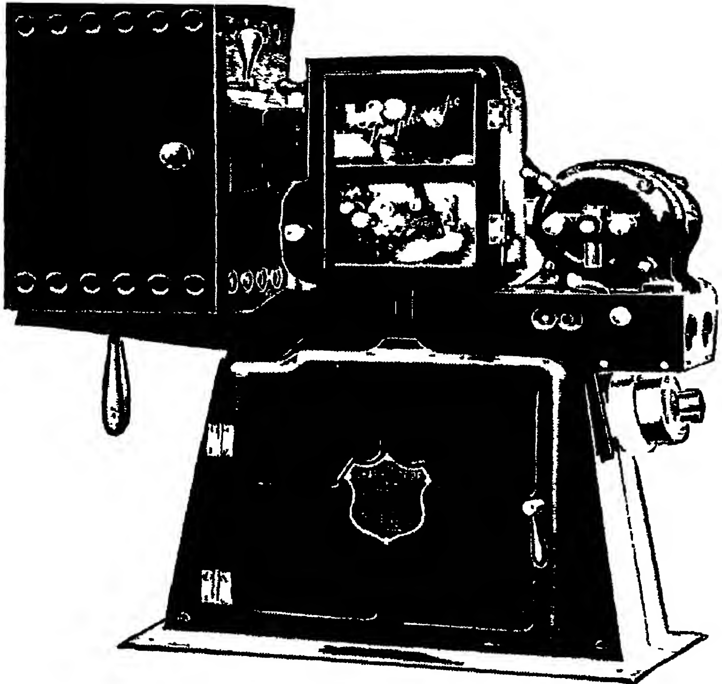
There are four safety standard projectors on the market, the Pathéscope, the Victor and one model each of the Beacon and the American Projectoscope. These sell at from $200 to about $300. They have a limit of throw of about fifty feet.

Electric Current

The electric current ordinarily found is 110 volts. Sometimes 220 volts is furnished. Home generated current is sometimes 32 volts, sometimes 110. The projectors referred to above are usually equipped to operate on 110 volts but can be fitted at the factory to operate on either 220 volts or 32 volts, or a transformer may be furnished to build up the current from 110 volts to 220 volts or to step it down to 32 volts, as needed.

The semi-professional, portable and narrow width projectors can be operated from ordinary electric light sockets by removing the lamp and screwing in its place the plug on the end of the cord attached to the machine. This operates both light and motor. Special wiring has to be provided for the professional machine. In purchasing a projector the voltage on which it is to be used should be told. All projectors except the professional have universal motors which operate with either direct or alternating current.

Schools which have not electric current or which make their own may operate certain of the portables or semi-professionals from a generator attached to the engine of a motor car or from the school generating plant. And there are types of projectors to be had for



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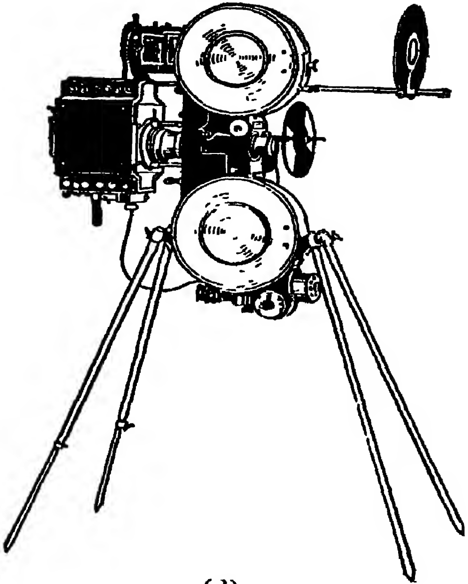

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SEMI-PROFESSIONAL PROJECTORS

(See List of Illustrations for description)

which the electric generator can be operated by hand or the jacked-up rear wheel of an automobile. The cinema is thus able to penetrate to the schools furthest removed from civilization.

Many schools do not confine themselves to one make or one type of projector but as the work in visual instruction progresses add more and more equipment to meet the varying needs.

In 1919 the Newark school began the use of films in visual instruction work, and two years later an inventory of visual aids showed thirty-four motion picture projectors in use, eleven Power Mazda, nine Power Arc, two Graphoscope, Jr., three Simplex, two Edison Arc, two Pathéscope, two Safety Cinema, one Peerless and for portable work one Safety Cinema and one Power Combination.

This great variety of types in the one school system was probably owing to the fact that various schools may have purchased independently. Better rates and better service could probably be secured by purchasing fewer types through a central agency.

It is not the province of this book to recommend the kind of projector to be purchased. It can only lay down a few general principles and leave the application to the reader.

For the auditorium, the professional machine should certainly be the preference, particularly if the distance between the booth and the screen is long—one hundred feet or over. In fact, for a throw of seventy-five feet, the professional type is recommended. If the professional type is too expensive, then ascertain which of the reliable portable and semi-professional makes have (and note that we say *have* and not *claim to have*)

the most efficient illumination and longest throw and give that weighty consideration.

For classroom use, a portable type is recommended. A portable may also be used in a small auditorium or in a larger one when the machine is placed near enough to the screen. Some users say they have secured efficient results with a certain make of portable at eighty feet from the screen.

Some of the semi-professional types are self-contained in one assembly unit and can, without excess of effort, be transferred from one room to another.

Screens

Next in importance to the projector is the screen. The best screen is a smooth white or light-colored wall. The next best is an absolutely opaque, flat white surface screen. The back of a large wall map serves the purpose admirably. A very good screen of flat white type, which is practically unbreakable and will not wrinkle, sells for one dollar per square foot. For an ordinary classroom, a screen six by eight feet is sufficiently large. The lowest price at which any satisfactory screen can be bought is about thirty cents per foot for a white sateen screen. Only fair results under ideal conditions can be obtained from this kind of screen, since it is not entirely opaque and considerable light passes through. A heavy canvas makes a better screen.

Metallic surface screens which give a high illumination can be purchased at from fifty cents to one dollar and a quarter per foot. This type of screen increases the brilliancy of the picture and so makes possible the showing of a larger picture, a picture at a greater distance from the projector, or a better picture in a room not entirely dark or projected by a weaker light than

with other types of screens. These screens are ordinarily called aluminum, silver, metallic or gold screens. There are several different makes.

Most of the screens mentioned can be supplied on spring rollers or may be mounted on a stretcher frame. Some may be obtained with graumets inserted, through which a rope for stretching or fastening is run.

Usually as clear and as sharply defined a picture can not be obtained from a metallic or other highly reflecting surface as from a flat surface because of the halation caused by the reflection of the light. Something of clearness is sacrificed to increased brilliancy. Where conditions are ideal, therefore, where projector illumination is adequate, the room dark, and the distance from the screen right, we would recommend the flat white surface screen.

A "daylight screen" is to be had which permits a clear picture to be shown in the subdued light of the ordinary classroom, provided the direct rays of the sun do not strike the screen. The use of this screen obviates the need even of drawing down the shades. This screen is translucent and requires rear projection. Either the projector must be in the rear of the screen or a mirror must be placed in rear. In the latter case the picture is thrown onto the mirror and reflected back to the screen. Darkness is required back of the screen between the projector and screen or between the projector, mirror and screen. This type of screen costs about three dollars per square foot.

While this type of projection is scarcely practicable in many classrooms as at present arranged, we can imagine the classroom of the future in which a portion of the wall is given over to a set-in screen and where, at a given signal from the teacher and without a pre-

liminary drawing of curtains, a sharp, clear picture suddenly appears illustrating the subject matter which is being studied.

Accessories

If the films are to be run more than once during the same period of rental, splicing material will be needed and a pair of rewinds desirable. Most of the portable and semi-professional machines are equipped with rewinding attachments, but rewinding in the projector causes unnecessary strain and wear on the motor. Further, where a break has occurred in the film or it is necessary or desirable for other reasons to rewind the film outside of the machine, separate rewinds will be needed. "Vest pocket" rewinds for occasional use can be purchased for a small sum. Full size rewinds cost from about $7.50 upward. The amateur will find a splicing machine helpful. While as much as $50 can be paid for the latest type of splicing device and so-called automatic splicing machines cost $200 or $300, a thoroughly practical type can be obtained for $13 or $14 and more simple kinds for even much less. An ingenious person can rig up one for himself. Many skilled projectionists do not use a splicer at all. A few razor blades and a twenty-five-cent bottle of film cement will complete the requirements. It is well to get the kind of cement which will mend both slow-burning and inflammable stock. The ordinary kind is good only for the latter. A small pair of scissors and a 1½-inch or 2-inch straight edge will be helpful.

Principles of Projection

Full directions for threading and operating accompany the projector and it is not necessary to go into

such details in this book. However, a simple explanation of some of the fundamental underlying principles of the motion picture and a few practical suggestions as to the handling of the film may not be amiss.

Motion pictures are nothing more nor less than a series of still pictures of a moving object taken at very short intervals, ordinarily of about sixteen exposures to a second, and projected in the same succession at about the same rate of speed. When shown at this speed the eye retains one impression for a fraction of a second after that image has disappeared and the next appears. The overlap causes the illusion of actual motion. This phenomenon is called "persistence of vision."

These exposures appear on the film as little photographs, one inch wide and three-quarters of an inch deep, called "frames," sixteen to the foot. There are approximately one thousand feet to the standard reel, sixteen thousand individual, separate photographs, except for the reading matter or titles, which are repeated on each frame for approximately as many feet as there are words.

To accomplish the semblance of motion the still pictures are taken on a strip of sensitized celluloid film which moves past the aperture in the camera, between each exposure, a distance of three-fourths of an inch. While this film, usually called "negative," is in motion, one of the blades of a revolving shutter covers the film and protects it from the light. The periods of rest and motion in the film as it passes through the camera are so short and rapid as to simulate continuous motion. As a matter of fact it moves by a series of short jerks. This is known as the "intermittent movement" already referred to in Chapter I.

This intermittent movement lies at the very heart of the motion picture. Without it the cinema as we know it today would be impossible. To provide for this series of jerks two loose loops of film must be provided, one above and one below the sprocketed wheels above and below the aperture. These sprockets intermittently jerk the film downward.

The projection machine works on exactly the same basic principle as the camera. A series of sprocket wheels pull and guide the film from the feed magazine past the aperture and feed it into the take-up magazine where it winds up on the take-up reel. If you start the mechanism and then immediately stop it, you can see the direction in which the various sprocket wheels travel. You can tell by studying this movement how to thread the film through. The film passes between the sprocket wheel and the guard in the direction in which the wheel is turning. A loop of film about 1½ inches high is left above the gate and below the sprocket wheel which is immediately below the gate. This is the intermittent sprocket. The loops are left to prevent the film from breaking just as a loop of thread is left in the sewing machine to keep the thread from breaking. This part of the explanation should appeal to the women teachers interested in film projection.

It is highly important in threading the machine, to see to it that the film fits snugly and straight in the gate and that the gate is closed.

The film is more glossy on one side than the other. The glossy side is the celluloid side or back of the film, the dull side is the one coated with emulsion and in which the picture lies. In all projection machines, except the Graphoscope, the film should be threaded in such a way that the emulsion side is toward the light

source. The Graphoscope projects through a prism, which reverses the image and requires that the celluloid side be placed toward the light source.

Of course, film must run through the gate upside down, just as a lantern slide is placed in the stereopticon lantern upside down in order to make the image come right side up on the screen. In determining therefore whether the film is "headed up" on the reel, that is, whether it has been rewound for running, hold the film upward from the reel. If the little pictures are right side up, the reel is ready to run; if wrong side up, it must be rewound before running. In threading the film on to the take-up reel in the lower magazine, first observe which way the reel turns while the motor is running.

How to Patch Broken Film

A word about patching broken film. At first it may seem difficult and sound complicated to the beginner, but by being careful and accurate a little practice soon makes it easy and simple.

When a splice must be made, two frames or pictures are usually lost, but unless the action is very swift the absence of one or two frames does not interrupt the action sufficiently to be noticed. To cut out more than this may cause a perceptible jump. When a film is torn and a splice must be made, first cut off the torn portion, cutting at one end along a "frame line," the narrow black line separating two pictures. On the other end, cut parallel to the next frame line but a little above, at least $\frac{3}{16}$ inch before you come to the next line. Then lay this end of the film emulsion side up on the table, lay a metal straight edge of some sort (a razor blade will do) along the frame line, then moisten the $\frac{3}{16}$

inch strip of film exposed and scrape the emulsion off clean. Apply the film cement to this strip so that every part is covered, and place the celluloid side of the other end on top so that the two frame lines come together. Press tightly together for a moment or two and the job is done if the cement is good and you have been skillful. If not, apply the cement again. If it does not hold then you may as well begin all over again and cut away the width of another frame from each end, for film will not weld unless thoroughly clean. If a splice comes apart it is usually best to cut away the width of a frame on each end and make a new splice.

If a splice comes apart in the machine below the gate, it will be necessary only to start and run the motor sufficiently to give you film enough to attach with a paper clip to the film on the take-up reel. If the separation occurs above the gate, you will have to re-thread.

A reel of film should always have a piece of extra film or "leader" spliced on to the beginning to be used in threading up and to protect the picture. If the leader should become unspliced it should be patched on again. This may be done without scraping, by placing the two celluloid sides together. Another piece of leader is needed at the end of the reel to protect the film as it leaves the mechanism.

As a protection against fire and for the sake of neatness all reels which are not in actual use should be kept in the cans or containers in which they come from the exchange or film library.

Never let the rays of light from the lamp play on the film or film gate when the film is not running. When you wish to stop the machine turn out the light, turn down the douser, or push the lamp house

aside, as provided in the particular projector being used, before turning off the motor. The skilled operator does both simultaneously. In starting, first start the motor before turning on the light, lifting the douser or pulling the lamp house into position.

Of course, keep your machine oiled and clean and in good condition. A particle of dust in the film gate may mar a good projection and a hair or thread across the film when projected will look like a log in its path. During projection, stay with your machine, with your hands on or near the controls. This is not only a necessary precaution against fire with inflammable film, but a protection against mechanical damage to either type of film.

If the film is not to be run again before its return to the exchange, do not rewind or make any splices, since the exchange prefers to examine and make repairs while rewinding. And finally return films promptly so that the next borrower on the list may not be disappointed and you may not incur additional rental charge. Should you be directed to forward the films to another borrower, rewind and repair the film before sending it, as he may not have the time or requisite knowledge or facilities for doing so. Put yourself in his place. You expect to receive film ready for running and so does he.

There are of course many points about adjusting, caring for and running projectors which can not be touched upon here but for which the novice will have to depend on the specific instructions accompanying the machine and the instructions of the agent. Neither can we go into the matter of optics and lenses or repairs. Special literature is available on these subjects at any public library.

Our only purpose here is to lay down some general

principles and suggestions which will make the reasons for things clearer and convince the amateur, particularly of the gentler sex, that the mechanics of motion picture projection are after all not so forbidding or terrifying as they might at first have thought. After all, threading and running a motion picture projector is very little more complicated than threading and running a sewing machine. The technique of installation need frighten no one who desires to use film.

Film instruction can be introduced into a school on a small scale with simple equipment and at a comparatively small cost. Ways and means of raising funds to pay for a projector are numerous. Usually the Board of Education appropriates the money, or loans it, the Parent-Teachers' Associations finance it, or friends and patrons may underwrite the project. Projectors have been bought on credit and paid for from the proceeds of school entertainments.

The following general rules set forth in the U. S. Bureau of Education bulletin on *Motion Pictures and Motion Picture Equipment* are worthwhile and should be observed. As will be noted, some of the suggestions apply only where a booth is required:

(1) Secure from the proper State authorities, city or county officials and board of fire underwriters a copy of existing rules and regulations governing the installation and use of motion picture apparatus and films. This will be a guide as to the handling and storage of film, insurance regulations, etc.

(2) Decide upon a room or hall that is to be used.

(3) Locate the place where the projector will stand and where the screen will hang.

(4) Measure the distance between the two points.

(5) Consult the company that manufactures your electric current and ascertain the voltage they supply.

(6) Secure from the company that insures the building a permit for the installation of a motion-picture projector.

(7) Purchase projection outfit, metal cabinet with spring-hinged doors for holding reels, screen, booth, if required, pair of re-winders, patching block, bottle of cement, shipping labels, caution labels, special cement for fastening labels to metal shipping cases (glue or paste will not hold). Get the kind of labels required by law in shipping films by express or parcel post.

(8) Engage competent electrician to install proper size cable for the electric current required. Also install on the ceiling of the booth one ordinary 16-candle power electric lamp, with pull chain switch.

(9) Place inside of booth near door one pail of sand, one pail of water, and one small hand fire extinguisher. Also place sand, pail of water and extinguisher near booth outside of door.

XII

LATE DEVELOPMENTS AND FUTURE POSSIBILITIES

In the thirty years since the first showing of films in the form we know them today, the term "motion picture," then unknown, has come to mean a vast industry, involving the expenditure of billions of dollars, touching the lives of six million people daily (conservatively estimated) and influencing their thoughts and habits and ambitions for good or evil. The motion picture is no longer in its infancy, or if so it is a precocious infant, for it is now going to school, to church, to college and has even entered business and made its way into the professions.

In its different ramifications the motion picture today is commanding the attention of some of the best brains of the country, not only of noted authors and prominent educators but of artists, scientists and inventors.

Many arts and some of the most exacting sciences go into the making of the present-day films. The skill of the chemist, the physicist, the painter, the sculptor, the designer, the dramatist, the artist, the actor, the artisan are employed in building the productions we see on our screens today. And for the building of the pedagogical film we must add the skill of the educator expert in the particular branch which the film teaches.

When we stop to consider the numerous elements

that go into the making of a motion picture, the many hands through which it passes, the many minds through which it must filter from author to censor, the highly technical knowledge required in its handling and treatment as it moves along its uneven and often tempestuous path from camera to screen, the wonder is that the result is as good as it frequently is.

The motion picture of excellence demands exceedingly rare qualities in the men who produce it. In the first place, a literary genius with a strongly developed dramatic instinct is needed to furnish the scenario. To put that scenario into workable continuity requires the technical knowledge and skill of one who knows literary values and also the limitations and possibilities of the motion picture camera and the resources, financial and technical, of the producing company. The camera man who is to film the picture should know the science of photography, something of art, much of cinematographic values and what his individual camera can and can not do. The actor should possess imagination as well as dramatic ability and a knowledge of the pantomimic art. The director who controls the destinies of the production should have a knowledge of world literature, especially of the dramatic; of sculpture, because from it he learns grace and line; of painting, for from it he learns composition; he should know color and light values and in addition should have ideals and imagination and tact and diplomacy,—in fact he should have the ability of eight ordinary men! And the technical men in charge of the details of our picture par excellence should be experts in their respective fields, be they directors, technical directors, electricians, engineers, craftsmen or mistresses of the wardrobe.

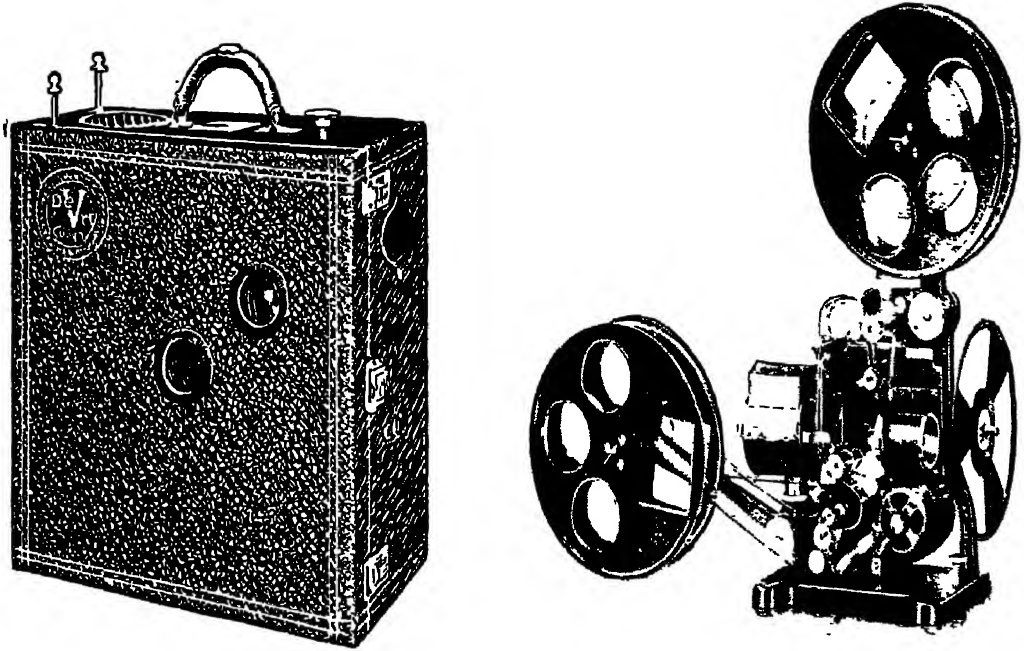
After actors, technicians, camera men and directors

have done their parts in recording the picture drama or narrative on sensitized film, the undeveloped negative is sent to the laboratory where it again passes through many expert hands and may be made or marred in the passing, depending upon the expertness and knowledge of those handling it.

In motion picture laboratory processes we find a most striking example of the application of chemistry to industry. The importance of the laboratory end of the industry is often under-estimated. In the best laboratories even the air is cleaned and washed and kept at a given temperature to prevent the slightest particle of dirt or dust from reaching and marring the film and to assure slow and even drying.

After it leaves the laboratory the film has still a long path to travel, and often a difficult one, in cutting, editing and titling. Many a good film has been mutilated in these processes, and clever cutting and titling have helped otherwise inferior films to box office success. Now come the censors! The London censors recently eliminated several scenes from a picturized version of *Oliver Twist,* not because it was not true to the book, but because they did not think those parts of Dickens' work were good for children, and the Philadelphia censors once ruled out the presentation of the *Passion of Christ* because it showed cruel and inhuman treatment.

To make the films we see today is an art, a science and an industry. In order to express ideas in this new language the motion picture of necessity takes to itself and applies all the other arts that have gone before,—architecture, sculpture, painting, pantomime, the technique of the drama, and the rhythmic art that lies back of dancing. Music is used as a setting to give at-



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TYPES OF PORTABLE PROJECTORS

(See List of Illustrations for description)

mosphere and for its psychological effect. Special music has been written for certain film dramas and greatly increased their appeal. The world's greatest literature has been used as a basis for scenarios, and scenarios of the future may prove, themselves, to be world literature.

Motion pictures have been the stimulus for many great developments in art, science and industry. This is notable in the field of illumination. The "sunlight arc," for example, and the 1,000-watt monoplane filament Mazda lamp have been developed primarily for cinematographic use, and recently a 30,000-watt incandescent lamp, with a capacity of about 60,000 candle-power, the largest lamp of its kind ever manufactured, was developed primarily for motion picture studio work. The wattage is 1,200 times greater than the average household lamp and the electric power required to operate three such lamps would run a trolley car. It is also claimed that the light from them is the nearest to sunlight yet achieved artificially. Thirteen of these lamps have been made for one motion picture studio.

Although much has been accomplished along all lines and today a whole new world stands revealed by means of the cinema, there are great possibilities for improvement in practically every branch.

Many new discoveries and inventions are being made and improvements perfected.

Experiments are being conducted with film stock, both to improve the quality and the "fastness" of the present stock and to replace the celluloid stock now in use with a cheaper and non-inflammable material (paper and even aluminum are being tried); with cameras for the taking of pictures; with all types of projectors used in showing films; with lighting effects

for taking pictures,—almost an unexplored field; with color photography; and with stereoscopic films and films that talk.

Noteworthy experiments now being conducted are those of Jenkins for the purpose of substituting continuous for intermittent movement in motion picture projection. All projectors over the world now employ the intermittent movement mechanism used in the original Jenkins machine which has been on view to the public at the National Museum at Washington, Graphic Arts Department, since 1896.

It is interesting to note that Jenkins first attempted to use the continuous instead of the intermittent movement and has now gone back to the original idea and found a means of applying it. Its application means a continuously running film, less wear on the ribbon and a light increase which will insure brighter projection.

Applying the new principle to machines for the home has resulted in the invention of the discrola, which resembles a phonograph in appearance. The picture record is lithographed on paper discs, many of them in color, in continuous spiral form. The idea of such a picture carrier was patented some time ago. It was not found practical until the discovery of the new principle of the rotating reflector glass ring which does away with the intermittent movement. Although these inventions, which have been witnessed privately by the authors, have not as yet been placed on the market, their general application may have a far-reaching effect.

As so often occurs, other inventors have been working along the same lines. We read that "a shutterless projector" with a continuously running film has been perfected by Samuel Bardy. In his machine, according to report, "there is a wheel with a series of lenses

fixed to its rim, and this wheel, continuously revolving, moves the film."

As a result of some of the improvements mentioned and of other developments of a more highly technical nature, we now have the stereoscopic picture, the film in natural colors and the talking picture, long predicted by the prophets and concerning which experiments have been made since the beginnings of motion pictures.

Stereoscopic Films

It is interesting to note that two different processes used in making stereoscopic films made their first public appearance in New York during the same week, the last week of 1922, a fitting climax, as it were, to the achievements of the year.

One was announced as the "Plasticon," or "film of the future," and the other as the "Teleview." In both of these productions motion pictures achieve the third dimension. To obtain the desired effect, in the case of the Plasticon pictures, the spectators has to look through colored glasses passed to them by the ushers, red covering the right eye and green the left. To view the Teleview films the spectator looks through a contrivance fitted with a revolving metal shutter synchronized with the shutter of the projector. The results are extremely life-like pictures, particularly vivid where great distances appear. The pictures are no longer flat surfaces. The objects pictured have depth as well as length and breadth.

They stand out in bold relief, possessed of the third dimension. The figures appear to be projected into the air in front of the screen, so close to the spectator at times that it almost seems possible to touch them. The illusion of reality is thus heightened without the

aid of the closeup, which tends to magnify facial defects and which has been greatly overused.

Films in Color

Much has been said and many predictions made regarding motion pictures in color. Color, as well as form, has a psychological effect. It has value in expressing emotions. Color photography when rightly used and combined artistically with black and white can add much to the artistic effect of a film. It can be and has been used effectively to show the beautiful and focal things in historical plays and fantasies, in portraying birds and flowers and clothes and other colorful subjects. At Jenkins' first public exhibition a film in color was shown. This was colored by hand, too expensive for general use. A process in which stencils are cut and color applied by machinery is the method used today in the Pathé colored films.

Many processes of natural color photography have been applied to the cinema with some degree of success. The Kinema-color process attained quite good results, but, like the trichrome pictures of Gaumont, it requires special projection equipment, and for this reason has not become commercially successful. For several years short reels made by the Prizma color process have been shown in some of the leading theatres of the country and have pleased. The first natural color film of feature proportions was made in Prizma color and shown in London early in 1922 and in April of the same year in New York City.

The next feature film in color to make its appearance on Broadway was in November, 1922, when New York saw its first Technicolor film, entitled *Toll of the Sea.* The technicolor process used in taking this film

in nature color was invented and perfected by Prof. Daniel C. Comstock of the Massachusetts Institute of Technology, after seven years of effort. Critics agree that the results are the most natural and realistic color values yet achieved on film.

Color value may also be given to film by tinting and toning. Tinting is dyeing the film any given color by dipping the entire piece of film into a color bath. Toning is accomplished by a chemical bath reacting on the silver in the emulsion. It colors only the darker portions of the film and leaves the high lights clear. Pleasing color combinations are obtained by a combination of tinting and toning. For example a pretty sunset effect may be secured by using a blue tone with a pink tint, giving to the film a range of colors running from blue through the intermediate hues of purples and lavenders to clear pink.

Although the picture-going public has seen and enjoyed films in color, natural and applied, and color is being used discriminately more and more to gain special effects, the art of color cinematography has still much to accomplish before a thoroughly satisfactory result is obtained.

Talking Pictures

Even before films in the form we have them today were known, Muybridge visited Edison to discuss whether there was not some way by which the pictures projected by his impractical Zoopraxoscope could be synchronized with the talking machine. Many attempts have been made since with varying success. Leon Gaumont gave some successful "filmparlants," but perfect synchronism between voice and film could not be sus-

tained because the film continued to break and in being spliced fell behind the time of the phonographic disc.

Other inventors have been working along different lines in an attempt to record sound vibrations photographically. The history of such attempts dates back almost as far as the telephone. But it has remained for Dr. Lee De Forest, inventor of the photion tube and audion amplifier to make commercially practicable the talking motion pictures, or the phonofilm, as he prefers to call it.

In a recent interview which the authors had with Dr. De Forest, he explained that the phonofilm, as the name implies, is the combination upon the same piece of film of sound and picture. To accomplish this the voice is translated first to electric current and then to light waves of different densities which are photographed on a very small portion of the sensitive film. The phonofilm resembles any other motion picture film in general appearance. Close examination, however, shows a square picture, with a dark band 3/32-inch wide down one side. This dark band is a photographic reproduction of sound. To record the voice the ordinary motion picture camera is used with the addition of the photion tube, by means of which sounds, which have been translated into electric current are re-translated into light and the light recorded on the sensitive film. After the sound has been photographed comes the problem of translating it back into sound. This is done by changing the steady light into fluctuating light and the fluctuating light into electric current which is then amplified. A sound projector lamp and a photo electric cell encased in two small metal tubes, which can be inserted in any standard projector, accomplish this feat and make the projection of talking motion pic-

tures commercially possible. But in order that a theatre audience may hear the sound so recorded the electric current is amplified one hundred thousand times by Dr. De Forest's invention, the audion amplifier. The first public exhibition of the phonofilm was at the Rivoli Theatre, New York City, during the week of April 15, 1923.

Probably many readers heard a demonstration, over the radio on Christmas Eve, 1922, of speeches by Vice President Coolidge, Secretary of War Weeks and Secretary of Navy Denby, made in Washington and recorded photographically on a *motion picture film.* The speeches were broadcasted from Schenectady and heard throughout this country and in some parts of Europe.

Movies by Radio

And going one step further we are scarcely surprised by the announcement that motion pictures of the next presidential inauguration may be broadcasted by radio, not hours afterwards, but at the time they occur, so that crowds in distant cities may see the inaugural parade as it wends its way down Pennsylvania Avenue to the Capitol, and both see and hear the President as he takes his oath of office, at the time of the occurrence.

When we visited Mr. Jenkins at his laboratory in Washington, where he is still busily at work endeavoring to perfect pictured motion, he informed us that he was working on apparatus for sending films by radio; and now comes the public announcement that by means of his machine it is possible to broadcast pictures, eliminating prints, plates and other media.

The process consists briefly in "slicing" the photograph to be broadcasted into hundreds of perpendicular

sections, and of moving the projected image of each section across a so-called photo-electrical cell whose ability to carry on electric current varies with the intensity of light falling upon it. The apparent slicing is accomplished by projecting the image through a revolving prismatic glass disc which operates similarly to the shutter of a motion picture machine. Light variations are transformed into electrical current variations and are reproduced as they are received in perpendicular "slices" and a completed picture built up. To accomplish this a new type of disc prism is employed. To transmit a still picture by radio now takes from three to six minutes, that length of time being required for the whole image to travel across the cell of the sending outfit. Motion pictures by radio are merely a question of greater speed. News pictures by radio appearing in the movie palaces of our large cities may be expected in a few years or perhaps months, so quickly are things happening.

With the natural color, stereoscopic, talking, moving picture all combined into one and that broadcasted by radio at the time of its occurrence, we may well say that there is nothing in the world, or in the sea beneath or in the air above that can not be shown by means of motion pictures. And this is literally true.

Aerial photography is proving more and more revealing and correspondingly useful. A special camera which works at a height of three miles has brought down absolutely trustworthy data on the area covered. The U. S. Geological Survey is making use of the airplane and motion picture camera in charting the Atlantic Coast. A French hydrographer has secured remarkable results with the air camera in mapping the harbor of Brest. A large western lumber company

conceived the novel idea of using aerial photography to count logs in river and bay!

With the invention of the submarine tube by the Williamsons, the wonders of the ocean have long since actually been photographed, and microphotography has revealed other wonders which have now become commonplace.

Animated Drawings

Animated drawings open a whole new field and have perhaps their greatest application in the educational film. By means of animated drawings and models it is possible to show many things that can be shown in no other way. Through this means, a cross section of a steam turbine can be shown at work, or the interior workings of an automobile engine can be explained in a fashion that a child in the grammar grades can understand. Hidden machinery can be revealed, the complicated operation of intricate machinery can be shown in detail, a motor revolving at the rate of five thousand revolutions a second can be slowed down so that its every movement can be easily followed and the generation and passage of electric current through it easily traced. These devices find application to school films in practically every branch of study. Already they have made the mysteries of the solar system an open book. And animated maps have enhanced greatly the value of geographic films. Animated drawings can present physiology in a way impossible through straight photography, and so with many other subjects. The potentialities of this field are limitless for future development. Dr. Frank N. Freeman, Professor of Educational Psychology, Chicago University, is authority for the statement that "the animated diagram may give a

better notion of structure and relationship than the sight of the object itself."

Participation of Men of Prominence

One of the very definite steps forward in the development of the field of educational films is the entrance from official life of such men as Francis M. Hugo, former secretary of state in New York. He, like William G. McAdoo and Will H. Hays, of presidential cabinets, who have entered the film industry on the theatrical side, has undertaken the organization of leaders of thought of the country behind the production and use of suitable pictures for school and church. To make it possible to assume this task on a practicable basis, Mr. Hugo has, while this book is in press, accepted appointment as chairman of the board of directors and executive committee of National Non-Theatrical Motion Pictures, Inc. Hugo's advent into this work lends a stability to the activity which only the participation of such substantial figures in public life can give.

An even later development is the appointment of Dr. Charles H. Judd, Dean of Education of the University of Chicago, by the National Education Association, as chairman of a committee to coöperate with the Motion Picture Producers and Distributors Association (the Will H. Hays organization) in the production and use of educational film.

European Progress

Equally significant in the growth of the visual idea in the school world is the coming to the United States of a representative of the Swedish government, in the person of Mr. Bengt Berg, well-known author and

naturalist, to study the progress in the use of films in schools. Mr. Berg, who has also studied film conditions in Europe, in discussing with the authors the report and recommendations that he would make to his government, stated as his opinion that the United States had made by far the most extensive use of films in education, with Sweden second, France third, and England fourth, but that Germany would undoubtedly have been in the lead had it not been for the World War.

The more progressive countries of Europe, according to Mr. Berg, are arrived at the point where they are ready to utilize films as an educational factor, but their financial burdens are so heavy and their income so limited that no European country or municipality can afford at this time to supply its whole educational system with motion picture equipment.

Mr. Berg's recommendation to his own country is (1) to arrange first with motion picture theatres to show educational films to the same classes of several schools at one time; (2) later to equip the larger schools in every city or township with motion picture apparatus, which will be available for the use of the other schools; (3) ultimately to equip every school and perhaps every class with a projector. This goal he considers a long way off.

He sees a very real objection to the use of films in the classroom in the inability of the woman teacher to handle the projector efficiently. This attitude seems to us to be due in part to the continental point of view with regard to women. The observations of the authors lead them to believe that the woman teacher is, as a rule, quite capable of handling the classroom projector, although we have recommended that a pupil or another teacher or perhaps the school janitor learn to run the

machine, in order to leave the teacher free to conduct the class.

Mr. Berg emphasizes the importance of using only the best possible pedagogical films for use in teaching the impressionable minds of the new generation.

Conclusions

It needs no great stretch of the imagination to look a short distance into the future and see the cinema, with all its shortcomings removed and its imperfections ironed out, occupying its proper and ideal place in school work, not as a usurper, not in the place of any of the elements of the school which time and experience have proven essential, but as a valuable helper, making lessons easier here, simpler there, quicker, more pleasant and perhaps more economical for pupil and school.

The mechanical difficulties will probably be first of solution. Eye strain, which is growing less each year as shutter action becomes better, will probably be entirely obliterated. The technique of installation and operation will be vastly simplified so that the woman teacher will experience even less trouble with such problems than she faces today. The fire hazard will no longer be a factor, for slow-burning film will have been adopted either for all purposes or at least for all school needs.

Through production in the large quantities needed by the schools, films will be cheaper than today and ample financial provision shall have been made for films and all other visual aids to meet the school demand.

Full daylight projection will be an accomplished fact. The screen will be an integral part of the classroom wall, the projector will either be permanently installed in a concealed position or be a proper part of the school-

room architecture and proper electrical connections will of course have been provided when the school itself was built.

In that day the talking picture will have been perfected, and instead of sub-titles appearing in the film, appropriate explanations of the picture will be given orally either by the film itself or perhaps, in accordance with William Parks' plan, by the teacher himself while only a number instead of the reading matter appears on the screen.

Of course improved pedagogical methods will have been developed for the use of all visual aids and their definite value more fully and concretely determined. The method of use of motion pictures will be taught in all teacher-training schools, where there will be regular courses in visual instruction.

Pictures of unquestioned pedagogical value will be available on all subjects capable of being presented effectively in film, and there will be an abundance of such material to choose from.

Every school system will have its visual education supervisor, an expert who will provide and oversee the use of all visual aids. Some large school systems may have film libraries of their own for which they will either buy outright or, better, lease by the year the films which they will need continuously and will have well-organized systems of deliveries of visual materials through the school system. Educational film companies will provide similar service to smaller school systems, private schools, colleges and universities.

The teacher who has observed the march of events motion-picturewise and given the subject of visual education serious thought will surely recognize that we are indulging in no wild and idle dream but that these

prophecies are based on logical premises and are the inevitable working out of forces actually in operation at the time of this writing.

Whatever adds to the efficiency of the school adds to the strength of the nation. Whatever increases the broad education of the child contributes to the moral stamina of the coming generation. The factors tending towards a better common understanding between the nations and peoples of the world will be the strongest guarantees of peace in the years to come. The welfare of the world lies in education, moral and intellectual, and whatever facilitates the training of the will and the understanding of man is working for his true happiness. Materials of instruction through the sense of vision have been improving in character and increasing in variety and effectiveness and their use has been adding to the value of school work even before Comenius introduced the illustrated textbook. As a fitting culmination to these centuries of growth has at last come the "visual textbook," as the pedagogical film is now sometimes called, bringing the wide world to the child, making him know at first hand, as it were, and better understand the people of other countries, their problems and their aspirations; causing him to recognize the brotherhood of man; broadening his viewpoint and his sympathies even as does travel and association with nature.

Thus will visual education help our earnest army of teachers broaden the youth of the land. Thus will our children be improved, their wills inspired, their moral fibre strengthened by a wider knowledge of the worth-while things of earth. If a great photoplay can inspire and strengthen, and if the morals of the nation can be

endangered by the depths to which all too many pictures descend, certainly the potency of the instructional film must be great indeed and should be given full opportunity to contribute to the nation's peace and well being.

APPENDIX

Motion Picture Distributors

A selected list of distributors whose films are mentioned in the foregoing chapters, who have collections of considerable size suited to instructional use, or who handle specialized libraries.

Only firms whose films are mentioned in the body of the text are given key initials in the list below. Write to addresses here given for catalogues, information regarding prices, branch office, etc.

COMMERCIAL COMPANIES

American Farm Bureau Federation,
58 East Washington Street, Chicago, Ill.
Distributes to agricultural organizations films relating to farming.

(A) Argonaut Distributing Corporation,
71 West 23rd Street, New York City.
Distributes primarily in New York City, film courses correlated with the curricula of the New York City Public Schools.

Beseler Educational Film Company, Inc.,
71 West 23rd Street, New York City.
Affiliated with Community Motion Picture Bureau.
Distributes educational, religious and entertainment films for non-theatrical use.

(B) Bray Productions, Inc.,
130 West 46th Street, New York City.
Distributes theatrical releases through Hodkinson, non-theatrical films directly.

(BCE) Bureau of Commercial Economics,
Washington, D. C.
A commercial concern which distributes industrial and educational films free to non-theatrical users.

(Ca) Carter Cinema Producing Corporation,
220 West 42nd Street, New York City.
Distributes educational films from New York.

(CA) Catholic Art Association, Inc.,
80 Fifth Avenue, New York City.
Branches in other cities.
Distributes religious films to Catholic institutions.

(Cl) Clinical Film Libraries,
132 West 42nd Street, New York City.
Distributes medical and surgical films to medical schools, hospitals, etc.

(C) Community Motion Picture Service,
46 West 24th Street, New York City.
Branches in other cities.
Furnishes selected programs and service to community organizations, schools, churches, etc.

(E) Educational Film Corporation,
729 Seventh Avenue, New York City.
Branches in other cities.
Specializes in the distribution of short length subjects for theatres.

(EK) Eskay Harris,
130 West 46th Street, New York City.
Juvenile features.

(FP) Famous Players Lasky Corporation,
485 Fifth Avenue, New York City.
Branches in other cities.
Distributes feature photoplays to theatres and in some territories to the non-theatrical field.

(FBO) Film Booking Offices of America,
723 Seventh Avenue, New York City.
Branches in other cities.
Distributes feature photoplays, comedies and short length educational subjects to theatres and the non-theatrical field.

(FN) First National Exhibitors Circuit, Inc.,
6 West 48th Street, New York City.
Branches in other cities.
Distributes feature photoplays to theatres and in some territories to the non-theatrical field.

(Fo) Ford Motion Picture Laboratories,
Detroit, Michigan.
Sells, rents and loans educational and industrial films. Prints obtainable on non-inflammable stock.

(F) Fox Film Corporation,
55th Street and Tenth Avenue, New York City.
Branches in other cities.
Distributes feature plays and news reels to theatres and photoplays and re-edited films for educational use. Write to New York office, Educational Department, for films for non-theatrical use.

(Ge) Geographic Film Company,
206 Mercantile Library Building, Cincinnati, Ohio.
Scenics on the holy land.

(Ha) Harcol Film Company, Inc.,
330 Camp Street, New Orleans, La.
Distributes educational and entertainment films throughout the southern territory.

Herald Motion Picture Corporation,
120 West 41st Street, New York City.
Distributes films primarily to Protestant institutions.

Herm, Inc., Charles F.,
220 West 42nd Street, New York City.
Sells and rents prints of scientific subjects.

(H) Hodkinson Corporation, W. W.,
469 Fifth Avenue, New York City.
Branches in other cities.
Distributes feature photoplays and one and two reel scenics to theatres and also to the non-theatrical field.

Homestead Films, Inc.,
7510 North Ashland Avenue, Chicago, Ill.
Distributes films primarily showing farm bureau work and on farm subjects.

(K) Kleine, George,
116 South Michigan Avenue, Chicago, Ill.
And 145 West 45th Street, New York City.

Matre's Library of Films,
76-78 West Lake Street, Chicago, Ill.
Distributes primarily Catholic films.

(NN-T) National Non-Theatrical Motion Pictures, Inc.,
130 West 46th Street, New York City.
Branches in other cities.
Distributes educational, religious and entertainment films in both professional and safety standard widths to the non-theatrical field. Slow-burning stock.

(P) Pathé Exchange, Inc.,
1600 Broadway, New York City.
Branches in other cities.
Distributes photoplays, news reels and educational subjects.

(Ps) Pathéscope Company of America, Inc.,
35 West 42nd Street, New York City.
Distributes entertainment and instructional films. All Pathéscope films are 28 mm. wide and cannot be used in projectors taking standard width 35 mm.

(PC) Pictorial Clubs, Inc.,
350 Madison Avenue, New York City.
Gives film service. Distributes feature films of three and four reels, comedies and educational films. Prints obtainable on slow-burning stock.

(PS) Picture Service Corporation,
729 Seventh Avenue, New York City.
Branches in some other cities.

(Pl) Plymouth Film Corporation,
46 West 24th Street, New York City.
Branches in other cities.
Distributes religious photodramas and educational subjects.

(Pr) Prizma, Inc.,
110 West 40th Street, New York City.
Distributes films in natural color theatrically and non-theatrically directly from New York office and in some territories through state right distributors.

Romell Motion Picture Company,
115 East 6th Street, Cincinnati, Ohio.
Distributes only 28 mm. films, which can be used only in safety-standard projectors.

(S) Selznick Corporation,
729 Seventh Avenue, New York City.
Branches in other cities.
Distributes feature photoplays to theatres and in some territories to the non-theatrical field.

(SVE) Society for Visual Education, Inc.,
806 West Washington Boulevard, Chicago, Ill.
Distributes school films on standard width slow-burning stock.

(UA) United Artists Corporation,
729 Seventh Avenue, New York City.
Branches in other cities.
Distributes feature photoplays to theatres and in some territories to the non-theatrical field.

(UPF) United Projector and Film Corporation,
69-71 West Mohawk Street, Buffalo, N. Y.
Branches in other cities.
Films are on slow-burning stock, 28 mm., and can be used only on safety-standard projectors.

(U) Urban Industries, Inc.,
Irvington-on-the-Hudson.
Sells prints direct to schools. Distributes non-theatrically through Pictorial Clubs, Inc.

(VT) Visual Text Book Publishers,
Los Angeles, California.
Distributes school films. Prints obtainable on slow-burning stock.

(V) Vitagraph, Inc.,
East 15th Street and Locust Avenue, Brooklyn, N. Y.
Branches in other cities.
Distributes feature photoplays to theatres and in some territories to the non-theatrical field.

(W) Warner Brothers,
1600 Broadway, New York City.
Distributes feature photoplays to theatres and to a limited extent to the non-theatrical field.

(WF) Worcester Film Corporation,
Worcester, Mass.
Rents and sells industrial-educational subjects.

(WY) F. S. Wythe Pictures Corporation, 71 West 23rd Street, New York City.

Non-Commercial Organizations

The majority of the following institutions distribute films free of charge except for transportation. Some make a small service or rental charge.

(AHS) American Humane Society,
Affiliated local societies.
Distributes a few films on animals.

(AM) American Museum of Natural History,
Columbus Avenue and 77th Street, New York City.
Lends films locally on special subjects.

(ARC) American Red Cross,
Films formerly distributed through Red Cross chapters now being released through the Society for Visual Education. (See SVE under commercial companies.)

National Tuberculosis Association,
370 Seventh Avenue, New York City.

Y. M. C. A.'s, International Committee of,
347 Madison Avenue, New York City.
Distributes through local Y. M. C. A.'s throughout the country.

Y. W. C. A.'s, National Board of,
600 Lexington Avenue, New York City.
Distributes selected films through local Y. W. C. A.'s.

EDUCATIONAL INSTITUTIONS

The following educational institutions distribute films either free or at small cost within the confines of their respective territories. Some of these institutions, including the State Universities, also furnish films for community use. Other State Universities having no regular film service are able to give information as to where films can be obtained and in some cases actually obtain them for the inquirer.

California, University of,
Berkley, Calif.

Colorado, University of,
Boulder, Colorado.

Florida, University of,
Gainesville, Fla.

Illinois Agricultural Association,
608 South Dearborn Street, Chicago, Ill.

Indiana University,
Bloomington, Ind.

Iowa State College of Agriculture and Mechanic Arts,
Ames, Iowa.

Kansas, University of,
Lawrence, Kansas.

Kansas State Normal School.
Emporia, Kan.

Kentucky, University of,
Lexington, Ky.

Louisiana State Normal School,
Natchitoches, La.

Massachusetts, Department of Education,
State House, Boston, Mass.

Minnesota, University of,
Minneapolis, Minn.

Mississippi Agricultural and Mechanical College,
Agricultural College, Miss.

Missouri, University of,
Columbia, Mo.

Nebraska, University of,
Lincoln, Nebr.

(CC) New York State Conservation Commission,
Albany, N. Y.

(NY) New York State Department of Foods and Markets,
Albany, N. Y.

New York Bureau of Public Health, Department of Education, New York City.
Health and food films.

North Carolina, State Department of Education,
Raleigh, N. C.

North Dakota Agricultural College.
Agricultural College, N. Dak.

Oklahoma, University of,
Norman, Okla.

Ohio, University of,
Columbus, Ohio

Oregon, University of,
Eugene, Ore.

Philadelphia Commercial Museum,
Philadelphia, Pa.

St. Louis Educational Museum,
St. Louis, Mo.

(Tex. AM) Texas, University of,
College Station, Texas.

Utah, University of,
Salt Lake City, Utah.

Washington State College,
Pullman, Washington.

(UW) Wisconsin, University of,
Madison, Wis.

U. S. Government

(USDA) United States Department of Agriculture,
Washington, D. C.
Requests for Department of Agriculture films should be made through Agricultural Extension Department of State University.

Bureau of Foreign and Domestic Commerce,
Washington, D. C.
Industrial films.

Children's Bureau,
Washington, D. C.

U. S. Bureau of Mines,
Pittsburgh, Pa.
Films on mining and mine safety work.

Manufacturing Firms

A selected list of firms whose films are mentioned in the foregoing chapters and others who distribute a considerable number of industrial-educational films. These films can usually be obtained free of charge except for transportation.

(A) Amoskeag Manufacturing Company,
Manchester, N. H.
Cotton and wool industry films.

(Ar) Armour & Company,
Chicago, Ill.
Packing industry.

(ANM) Mrs. A. N. Meyer,
20 East 75th Street, New York City.

American Optical Company,
Southbridge, Mass.
Films on care of the eyes.

Barber Asphalt Paving Company,
Philadelphia, Pa.
Films on road construction.

Barrett Company,
17 Battery Place, New York City.
Films on road building, coal, coke and coal tar products.

Borden Milk Company,
108 Hudson Street, New York City.
Films on dairying.

Burroughs Adding Machine Company,
Detroit, Mich.

Buick Motor Company,
Flint, Mich.
Automobile industry.

(Su) California Fruit Growers' Exchange.
Los Angeles, Calif.

Carborundum Company,
Niagara Falls, N. Y.
Films on abrasives.

Carnation Milk Products Company,
Seattle, Washington.
Films on dairying.

(CP) Corn Products Refining Company,
17 Battery Place, New York City.

Disston (Henry) & Sons, Inc.,
Philadelphia, Pa.
Hand tools.

Doubleday, Page & Company,
Garden City, N. Y.
Book and magazine making.

(DM) Dry Milk Company,
New York City.

Dupont Powder Company,
Wilmington, Delaware.
Road building and use of explosives.

Eastman Kodak Company,
Rochester, N Y.
Films on welfare and how movies are made.

(EA) Encyclopedia Americana,
27 William Street, New York City.

Firestone Tire & Rubber Company,
Akron, Ohio.
Films on welfare and automobile industry.

(GE) General Electric Company,
Schenectady, N. Y.
Films on a variety of educational subjects.

Ginn & Company,
Boston, Mass.
Films on bookmaking.

(GF) Goerz Flour Mills,
Kansas City, Mo.

(HM) Hecker Milling Company,
Minneapolis, Minn.

Hercules Powder Company,
Wilmington, Delaware.

Holt Mfg. Company,
Peoria, Ill.
Films on tractors.

(I) International Harvester Company,
Chicago, Ill.
Films on farming, dairying, gardening and household economics.

(KS) Keith Shoe Company,
Boston, Mass.

(K) Kirkman & Son,
Bridge and Water Streets, Brooklyn, N. Y.
Films on a variety of subjects, including the manufacture of soap.

Libby, McNeal & Libby,
Chicago, Ill.
Films on food products.

(LB) Long-Bell Lumber Company,
Kansas City, Mo.

(M) Mitchell Motor Car Company,
Racine, Wis.

National Association of Manufacturers,
30 Church Street, New York City.
Welfare films.

National Cash Register Company,
Dayton, Ohio.
Welfare, community and safety device films.

Packard Motor Car Company,
Detroit, Mich.

Public Service Ry. Co.,
Newark, N. J.

(Sh) Sheffield Farms Co.,
524 West 57th Street, New York City.

(SO) Standard Oil Company,
New York City.

Underwriters' Laboratories,
Chicago, Ill.

United States Steel Corporation,
71 Broadway, New York City.

(WE) Western Electric Company,
195 Broadway, New York City.

(W) Westinghouse Electric Company,
East Pittsburgh, Pa.

RAILROADS

Films on scenery, welfare and Americanization.

Baltimore & Ohio R.R. Co.,
Baltimore, Md.

Canadian Pacific Railway Co.,
Montreal, Canada.
Scenics. Also distributes through the Bureau of Commercial Economics, Washington, D. C.

Canadian Pacific R.R. Co,
Montreal, Canada.

Chicago, Milwaukee & St. Paul R.R. Co.,
Chicago, Ill.

Denver & Rio Grande R.R.,
Equitable Bldg., Denver, Colo.
Scenics.

Grand Trunk Pacific R.R. Co.,
Montreal, Canada.

Great Northern R.R. Co.,
St. Paul, Minn.

New York Central R.R. Co.,
Grand Trunk Terminal, New York City.

Northern Pacific R.R. Co.,
St. Paul, Minn.

Pennsylvania R.R. Co.,
Philadelphia, Pa.

Union Pacific R.R. Co.,
Chicago, Ill.

There are several hundred other firms each of which has one or more films showing its own products. Some of the firms mentioned distribute both directly and through such centers as the Bureau of Commercial Economics at Washington, the Industrial Department, International Committee of Young Men's Christian Associations, New York City, and the Extension Departments of the State Universities.

Many of these films are useful for instruction and can

usually be secured free except for transportation. A fairly complete list of industrial films, classified by subjects, and the sources from which they may be obtained can be purchased for twenty-five cents from the National Board of Review of Motion Pictures, 70 Fifth Avenue, New York City.

Projection Manufacturers

A list of some of the principal makers of projection machines. All the machines mentioned in this list carry the professional standard width film (35 mm.), unless otherwise indicated.

Acme Motion Picture Projector Co.,
806 West Washington Boulevard, Chicago, Ill.
Acme (semi-portable and portable) projectors.

American Projecting Company,
6264 Broadway, Chicago, Ill.
American Projectoscope (portable), professional standard (35 mm.) or safety standard (28 mm.) width as preferred.

De Vry Corporation,
1240 Marianna Street, Chicago, Illinois.
De Vry (portable) projectors.

Nicholas Power Company,
90 Gold Street, New York City.
Powers' professional standard and light standard projectors.

Precision Machine Company,
317 East 34th Street, New York City.
Simplex professional projectors.

United Cinema Company,
130 West 46th Street, New York City.
Graphoscope (professional), Graphoscope, Jr. (seci-professional), and Portmanto (portable) projectors.

Safety Projector Company,
310-312 West Second Street, Duluth, Minn.
Zenith (semi-professional) projectors.

Continental Sales Corporation,
112 Miners' Bank Building, Wilkes-Barre, Pa.
Burwood (semi-professional) projectors.

Victor Animatograph Company,
Davenport, Iowa,
Victor Animatograph (semi-professional 35 mm.) projectors and The Victor Safety Cinema (28 mm.) projectors.

Beacon Projector Company,
521 West 57th Street, New York City.
Beacon (portable) projectors, one model for professional standard film and one model for safety standard film.

Pathéscope Company of America,
35 West 42nd Street, New York City.
Pathéscope (28 mm.), Peerless (35 mm.) portable projectors.

Screen Manufacturers

Some of the principal makers of reliable screens.

American Lux Products Company,
50 East 42nd Street, New York City.
Trans-lux daylight screens.

Minusa Cine Screen Co.,
2665 Morgan Street, St. Louis, Mo.
Metallic surfaced screens.

Raven Screen Corporation,
165 Broadway, New York City.
Halftone, flat white, rubber back screens.

C. S. Wertsner & Son,
211-221 North 13th Street, Philadelphia, Pa.
Muslin, sateen, white and metallic surfaced screens.

Manufacturers of Miscellaneous Equipment

Johns Manville Company,
Madison Avenue and 41st Street, New York City.
Branches in many large cities.
Asbestos booths.

George Howard, Inc.,
Mount Vernon, N. Y.
Sheet metal booths.

United Theatre Equipment Corporation,
25 West 45th Street, New York City.
Branches in other cities.
All equipment and supplies.

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